



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 10

1200 Sixth Avenue, Suite 900

Seattle, WA 98101-3140

OFFICE OF
COMPLIANCE AND ENFORCEMENT

JUNE 16-18, 2010 TOUR OF OREGON FORESTRY AND PESTICIDE USE ISSUES TRIP REPORT



October 19, 2010

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Office of Compliance and Assistance**

U.S. EPA Region 10 June 16-18, 2010 Trip Report



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This Trip Report is intended to convey information the U.S. Environmental Protection Agency, Region 10 (EPA) collected and observed during a tour of forestry and pesticide use issues in the coastal mountain region of Oregon. This Report describes where EPA went, who EPA spoke with, and what major concerns were expressed related to pesticide use practices in commercial private forestry operations.



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TABLE OF CONTENTS

	Page
I. Introduction	
a. Purpose and Background of Tour	4
II. Tour Development	
a. Day Owen, Pitchfork Rebellion	4
b. Kevin Kohlman/ Oregon Toxics Alliance	4
c. Oregon Department of Agriculture, Oregon Department of Forestry and Timber Company Reps	4
d. Other Requests	5
III. Description of Tours	
a. Oregon Department of Agriculture, Oregon Department of Forestry and Timber Company Reps	6
i. Participants	6
ii. General description of tour	6
iii. Summary of major concerns and issues	14
b. Day Owen / Pitchfork Rebellion	
i. Participants	16
ii. General description of tour	16
iii. Summary of major concerns and issues	28
c. Kevin Kohlman	
i. Participants	29
ii. General description of tour	29
iii. Summary of major concerns and issues.....	34
d. Oregon Toxics Alliance	
i. Participants	35
ii. General description of tour	35
iii. Summary of major concerns and issues	39
IV. Summary	40
V. List of Appendices and Attachments	42



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I. Introduction.

a. Purpose and Background of Tour. The U.S. Environmental Protection Agency, Region 10 (EPA) conducted the tour to better understand claims by individuals and organizations that unique topographical and meteorological conditions in the Oregon coastal mountain range influence the movement of pesticides that are applied aerially for commercial timber operations. The individuals and organizations claim these conditions cause the pesticides to move or drift offsite and adversely impact people's health and the environment. These views have been expressed to EPA intermittently over several years through individual phone and email complaints to the Agency. The issue took on additional attention in January of 2010 after a local interest group called "The Pitchfork Rebellion" submitted a petition describing these concerns to the Administrator of EPA. Subsequently, the EPA Office of Pesticide Programs (OPP) at EPA Headquarters decided to open a docket to receive public comment on the petition (available at: <http://www.regulations.gov/search/Regs/home.html#docketDetail?R=EPA-HQ-OPP-2010-0265>).

The tour was not intended as a scientific/technical analysis of the issue or an official Agency response to the petition, but rather to provide Pesticide Program staff from the EPA Regional Office the opportunity to observe general local geographic conditions firsthand and discuss the issue with interested and affected stakeholders such as State agencies, the forest resource industry, environmental advocacy groups, and concerned local residents.. This Trip Report is intended to capture relevant information and observations from the tour for EPA staff, as well as for the stakeholders that assisted EPA in planning and conducting the tour.

II. Tour Development.

a. Day Owen, Pitchfork Rebellion EPA's initial plan was limited to touring the area with Day Owen and associates from the Pitchfork Rebellion to observe, first hand, the groups concerns regarding the use of pesticides in timber stands in the Siuslaw valley of the Oregon coastal mountain range and to obtain local information that may be useful to OPP staff involved in assessing and responding to the submitted petition as no one from HQ was able to travel to the area and directly participate in the tour.

b. Kevin Kohlman, Oregon Toxics Alliance. Shortly after EPA set the date for the visit (June 17, 2010), and awareness of EPA's trip increased, the Oregon Toxics Alliance (OTA) and a Viticulturist, Kevin Kohlman (Kohlman), requested that EPA tour additional areas of interest in the coastal mountain ranges of Oregon. EPA agreed to visited Kohlman's farm in the mountains west of Sutherlin Oregon (about 50 miles south of Eugene), and an Organic Blueberry Farm just east of Springfield Oregon (see **Figure 1**). Each group wanted to share their particular issues associated with pesticide use in forestry and illustrate their views that unique local factors might affect the movement of pesticides from the intended target site.

c. Oregon Department of Agriculture and Oregon Department of Forestry. The Oregon Department of Agriculture (ODA) suggested that EPA also meet with the Oregon Department of Forestry (ODF) to better understanding the pesticide issues specific to the region. Upon request from EPA, ODA and ODF organized the meeting and area tour. As part of the tour, ODF invited timber representatives from Weyerhaeuser and Seneca Jones Timber Products Company (Seneca) to join the tour at their respective units in the Triangle Lake portion of the Siuslaw valley.



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d. Other Requests. Due to the lack of time, two requests for additional tour stops were not added to the itinerary. Oregonians for Food and Shelter and the Weyerhaeuser Manager for the Cedar Flats plot requested time during the tour to share their thoughts regarding pesticide use in Oregon forests. In lieu of a meeting during the tour, EPA met with the Oregonians for Food and Shelter on July 9, 2010 at the EPA Region 10 Office in Seattle. Representatives from Weyerhaeuser, Seneca, Roseburg Forest Products, and Washington Friends of Farms and Forests participated in the meeting where several topics, including EPA's recent tour, were discussed

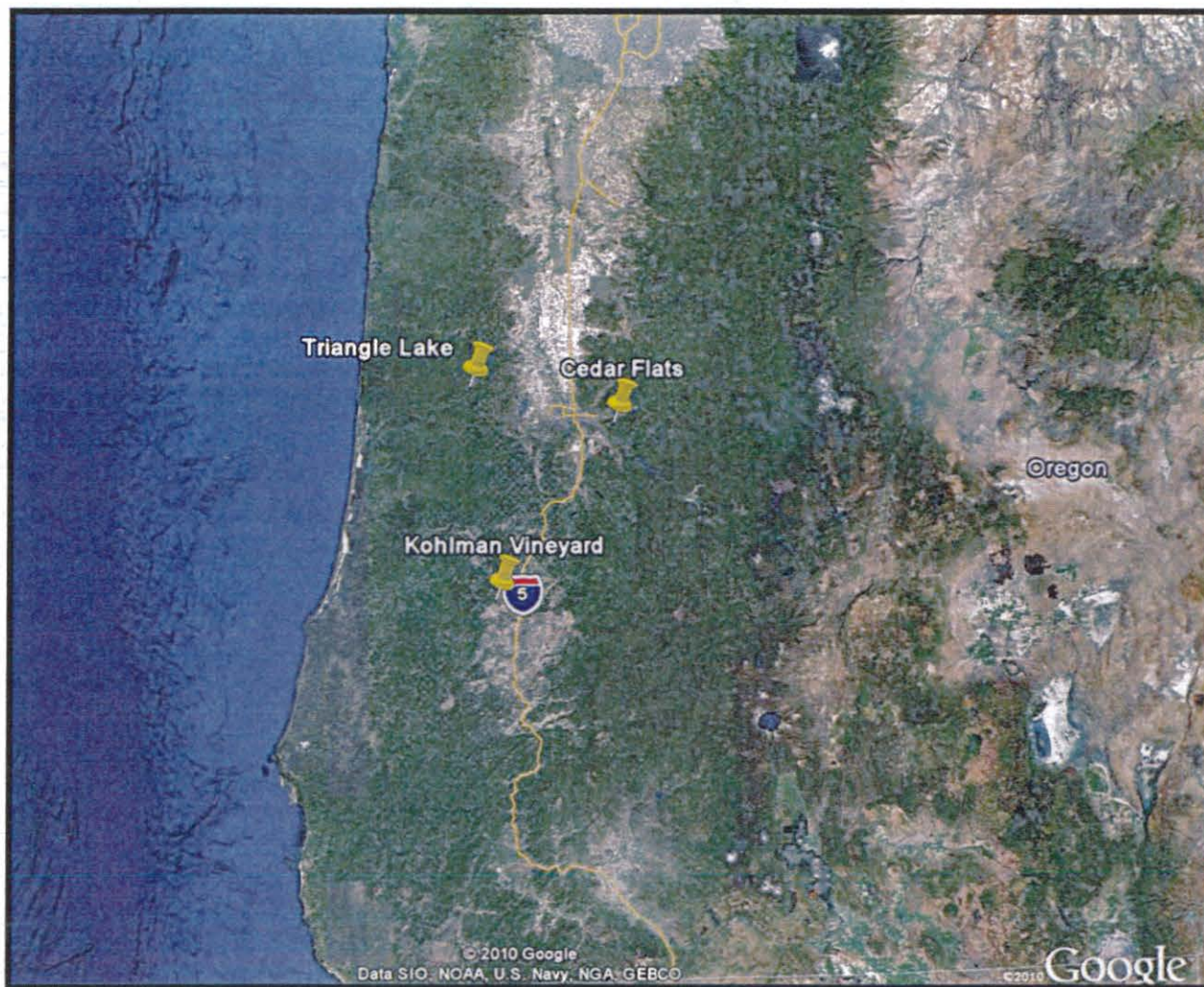


Figure 1. Main Tour Stops near Eugene, Oregon. Both the Pitchfork Rebellion tour and the ODA/ODF tour focused on the Triangle Lake area.



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III. Description of Tours

a. Oregon Department of Agriculture, Oregon Department of Forestry
and Timber Company Reps (June 16, 2010)

i. Participants.

ODA

Michael Odenthal
Dale Mitchell

ODF

Marganne Allen
Link Smith
Dave Lorenz
Brad Knotts
Paul Clements

EPA

Chad Schulze
Erin Halbert

Timber Companies

Al Landerholm (W)
Willie Bronson (W)
Greg Miller (W)
Mike Evans (SJT)
Ted Riess (SJT)

ii. **General Description of Tour.** EPA met with ODA and ODF personnel in the ODF Venneta Office just outside of Eugene, Oregon. ODF provided an agenda for the day (**Attachment 1**) which included a presentation on the general overview and history of ODF (**Attachment 2**) and meeting times for the main stops along the Western Lane County Tour: Weyerhaeuser's Fish Creek Units, Seneca's Fish Creek Unit, and the Triangle Lake School (**Figure 2**).



Figure 2. Main tour stops with ODA, ODF, and Timber Companies.



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ODF provided the following materials for reference at the meeting:

- An illustrated manual titled *Oregon's Forest Protection Laws (Appendix A)*
- The Forest Practice Administrative Rules and Forest Practices Act and 2008 Supplement (*Appendix B*)
- A January 1997 Forest Practice Notes article on *Chemicals and Other Petroleum Products (Appendix C)*
- The July 6, 1995 Memorandum of Agreement between the Oregon Department of Agriculture and the Oregon Board of Forestry (*Appendix D*)

ODF also provided the following studies regarding the deposition of aerial sprays in Oregon's coastal mountain range:

- A March 2000 ODF Final Report entitled *Aerial Pesticide Application Monitoring (Appendix E)*
- An April 2002 ODF Final Report entitled *Best Management Practices Compliance Monitoring Project (Appendix F)*
- A 2009 American Society of Agricultural and Biological Engineers study titled *Deposition of Aerially Applied Spray to a Stream within a Vegetative Barrier (Appendix G)*

Prior to leaving the Venneta office, ODF reviewed the Notification of Operation/Application for Permit (Notification) process. This process is required for chemical applications as well as other "operations" related to any commercial activity involving the establishment, management or harvest of forest tree species. Chemical applications include pesticides, additives, petroleum based carriers and fertilizers. ODF illustrated how they manage and process the Notifications and provided EPA an example Notification form (see **Attachment 3**). ODF explained that Notifications are not permits, rather, they provide ODF with the who, what, when, and where of any forestry operation. As part of the process, ODF notifies an operator of any nearby sensitive area or protected resource including water features (lakes, wetlands, and streams), and endangered/ threatened plants and animals, and informs the operator of the required buffers. ODF also uses the Notifications to target pre-operation and active operation inspections.

Depending on the operation, some activities also require a written plan prepared by the land owner prior to the start of any activity. The written plan must describe how an operation will be conducted consistent with the forest practice rules. These plans are always required for operations within 00 feet of Type F and D streams or large lakes, 300 feet of a significant wetland, and 300 feet of a sensitive wildlife site used by threatened or endangered species or other sensitive birds. Written Plans may also be required for other activities that require prior approval (see page 124 of the *Oregon's Forest Protection Laws Illustrated Manual* in Appendix A).



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Tour Stops:

Weyerhaeuser Fish Creek Units

Three Weyerhaeuser representatives, Al (?), Willie Bronson, and Greg Miller, joined the tour at the Triangle Lake Ridge - Weyerhaeuser's Fish Creek Unit #1. As illustrated in **Figure 3**, the ridge overlooks Triangle Lake to the northwest and the Fish Creek Unit #1 to the southeast.

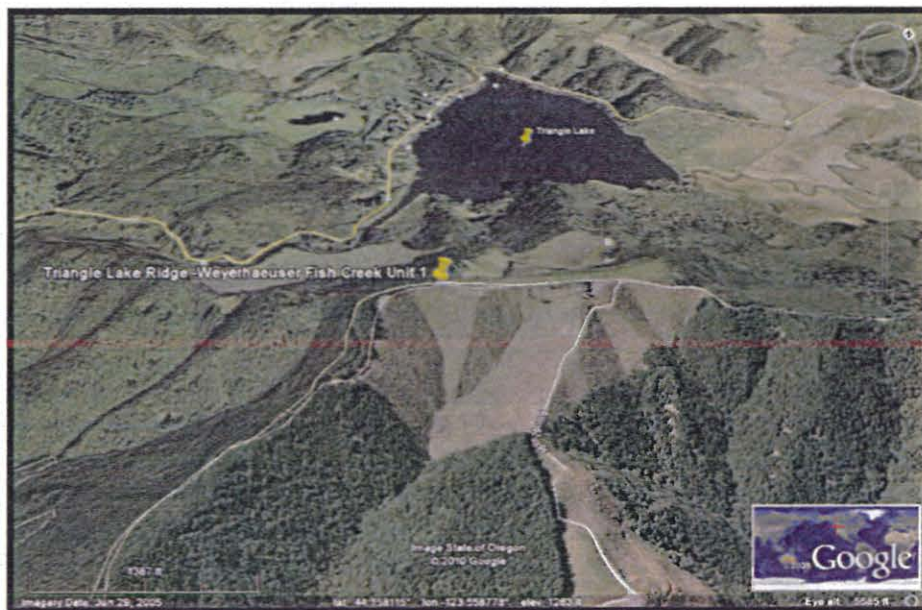


Figure 3. Aerial photograph of Weyerhaeuser's Fish Creek Unit #1.

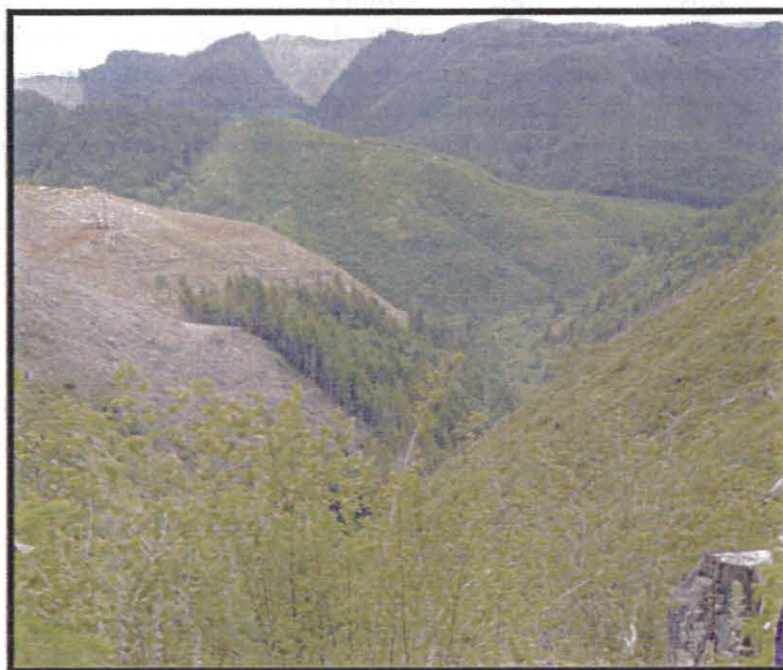


Figure 4. Weyerhaeuser Fish Creek Unit #1 looking SE.



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The slopes of this site were moderate, approximately 35 to 45%, which is very typical for this area. This site is a good illustration of four stages of forestry production (see **Figure 4**). The right, light green slope in the foreground was logged 6 years ago and replanted 5 years ago. Weyerhaeuser stated they broadcast burned this site instead of applying traditional pesticides and that it appeared to have successfully suppress competing species. The left grey slope in the foreground was planted February 2010 and was sprayed last November (2009) to prep the site for planting. Depending on competing species, Weyerhaeuser stated that the site may be sprayed with Oust again in the fall and most likely will not be sprayed again until harvest in 40 to 50 years. If competition from alders or big leaf maples is still strong, Weyerhaeuser may "Hack and Squirt" the site a few times to ensure the planted trees can grow up over them. "Hack and Squirt" operations entail physically cutting back the competitive plants and then applying pesticides directly to them.

Once the planted Douglas fir trees have shaded most of the undergrowth (a stage called "Free to Grow") no more pesticides are applied to the site until the next harvest. According to the FPA, forestry units must reach "Free to Grow" within 6 years of harvest. The brown slope on the left just beyond the grey foreground was just logged in the spring of 2010 and workers were actively collecting the logs during our visit. Weyerhaeuser stated that this site will most likely be sprayed in fall (2010) to prep for planting in the fall of 2011. The green slope in the middle of Figure 4, just beyond the brown slope was planted over twelve years ago and will not be sprayed until after it is harvested in 30 to 40 years. Weyerhaeuser pointed out that the site has several thick stands of Scotch broom, but stated that the trees will shade them out in a couple of years. Weyerhaeuser also stated that after 20 years of growth, they typically apply fertilizers by air every eight years and that they generally apply twice as much fertilizer as pesticides to forestry units. For more photographs of Weyerhaeuser Fish Creek Unit #1 and the entire tour, please see the photos in **Attachment 4**.



Figure 5. Weyerhaeuser Fish Creek Unit #2 in relation to Fish Creek Unit #1.



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Figure 6 and 7. Weyerhaeuser Fish Creek Unit #2 looking approximately north.

The next site, Weyerhaeuser Fish Creek Unit #2, is directly Southeast of Fish Creek Unit #1 (**Figure 5**). ODF and Weyerhaeuser selected this site to illustrate their claims that aerial pesticide applications can be accurately applied to the intended target site. **Figure 6** shows a stark delineation between the green undergrowth of the riparian area (foreground) and the brown clear cut unit in back. **Figure 7** shows a close-up of the sprayed clear cut area. This unit lays adjacent to Fish Creek, which is in the opposite direction of photos, and required a Written Plan for the application since Fish Creek is fish bearing. The site was sprayed aerially last September using split boom technology (turning off one half of a full boom) and via spot treatment. In response to a local resident's complaint of drift, ODA investigated the September application and did not identify any violations of Oregon pesticide rules. Weyerhaeuser provided a color topographic map that indicated the distances from their Units to the closest, concerned residences (see **Attachment 5**). Most residences are located over 3,000 feet from the forest units (see **Figures 8** for Google Earth Pro (GEP) maps with distances to nearby residences).



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Figure 8. Distances from Timber Units (yellow pins) to residences (end of blue lines).

Seneca Jones Timber Company Fish Creek Unit

Seneca representatives, Ted Reiss and Mike Evans, joined the tour at their Fish Creek Unit which lays about one mile Southwest of Triangle Lake (see Figure 9). The Fish Creek Unit is approximately 400 acres and, as illustrated in Figures 10, 11, and 12, has moderate slopes of up to 35 % which angle Northwest and Southeast. The site was harvested in October of 2007 (note: the GEP aerial photograph was taken before the unit was cut). The site was sprayed in late fall 2007 to prep for planting which occurred in the spring of 2008.

The latest aerial application (on 16 acres) occurred in March of 2009 and was observed by Clements of ODF. Concerned residents Dan and Maya Gee asserted in a complaint to Clements while he was observing the application that Seneca was applying in fog and that the product was moving off target and making them ill. The Gee's live about 3,500 feet to the North (see Figure 8 for an aerial view of distance and Figure 10 for a cross-sectional view of the distance to the Gee's residence).



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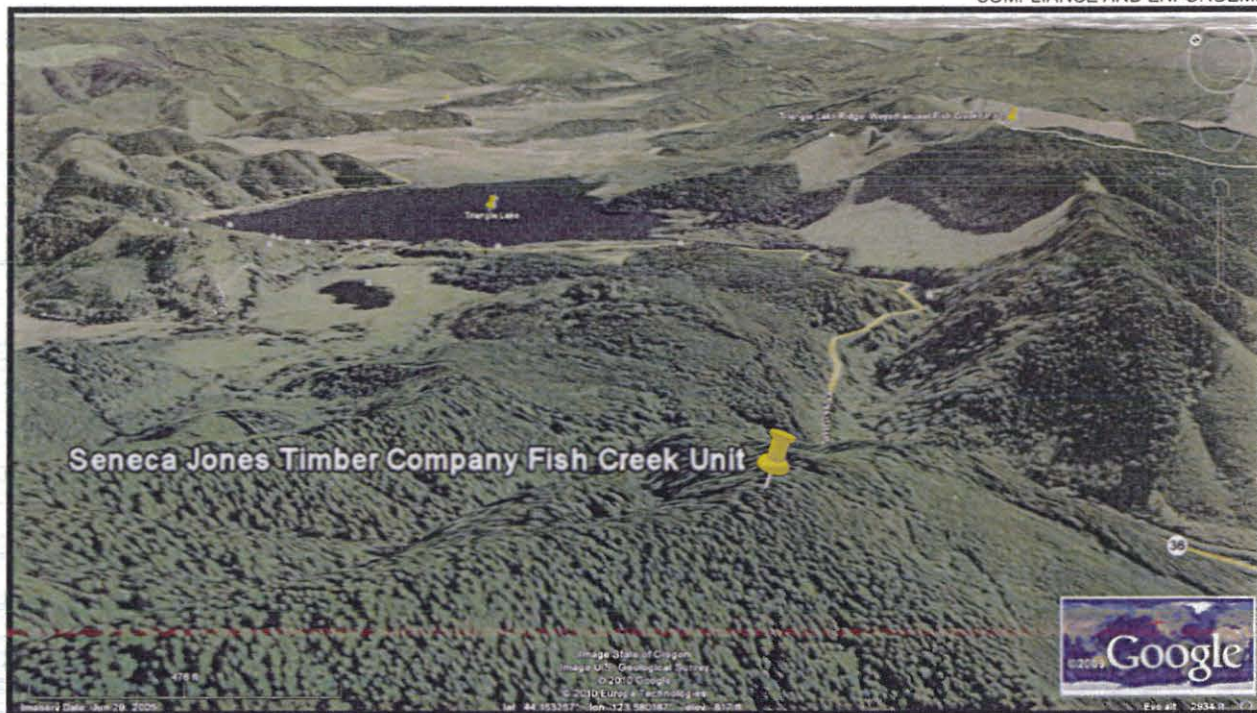


Figure 9. Seneca Fish Creek Unit (SW of Triangle Lake)

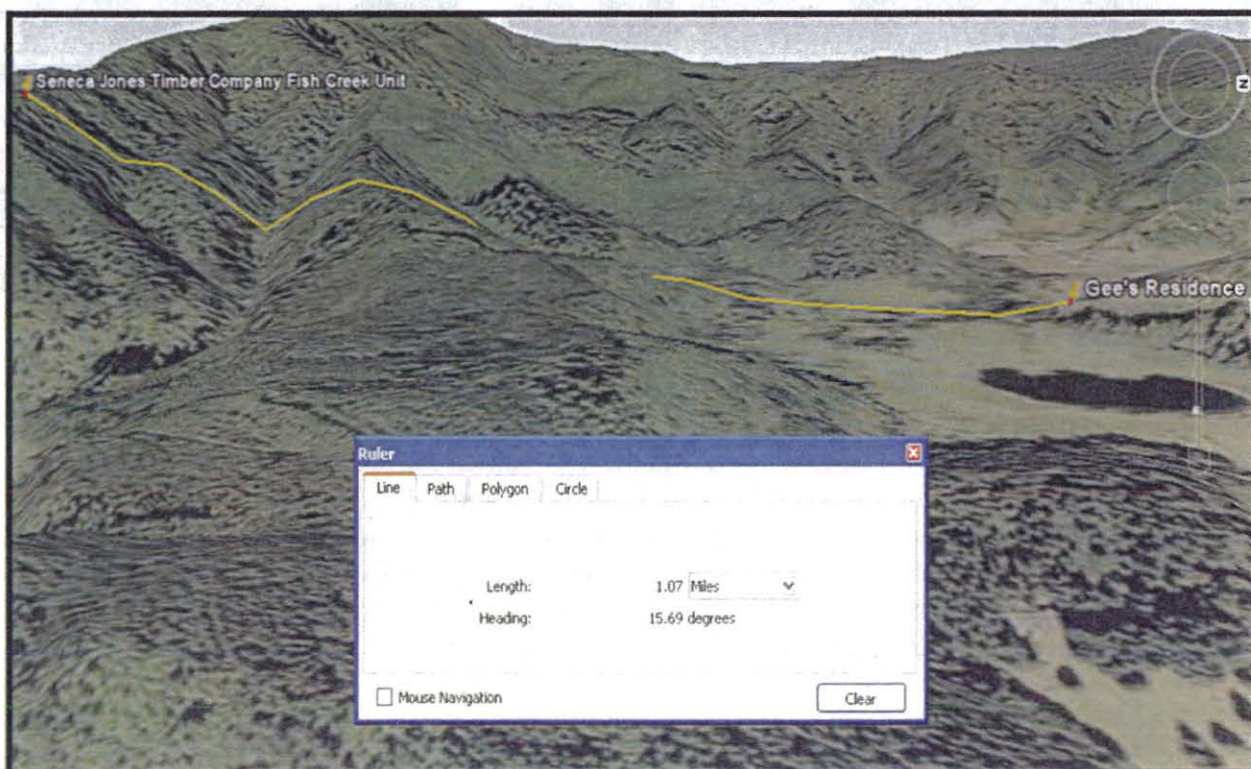


Figure 10. Cross-sectional view of distance between Seneca Fish Creek Unit and the Gee residence.

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Figures 11 and 12. Seneca Fish Creek Unit (Figure 11 looks north while Figure 12 looks west down the slope).

Clements provided a packet of information to EPA regarding the March 2009 application and subsequent complaint, which includes; the ODF Notification, topographic maps, a terrain profile diagram and email correspondence with the Gee's (**Attachment 6**).

Triangle Lake School



Figure 13. Triangle Lake School. (Note that the GEP photo was taken before unit was cut).



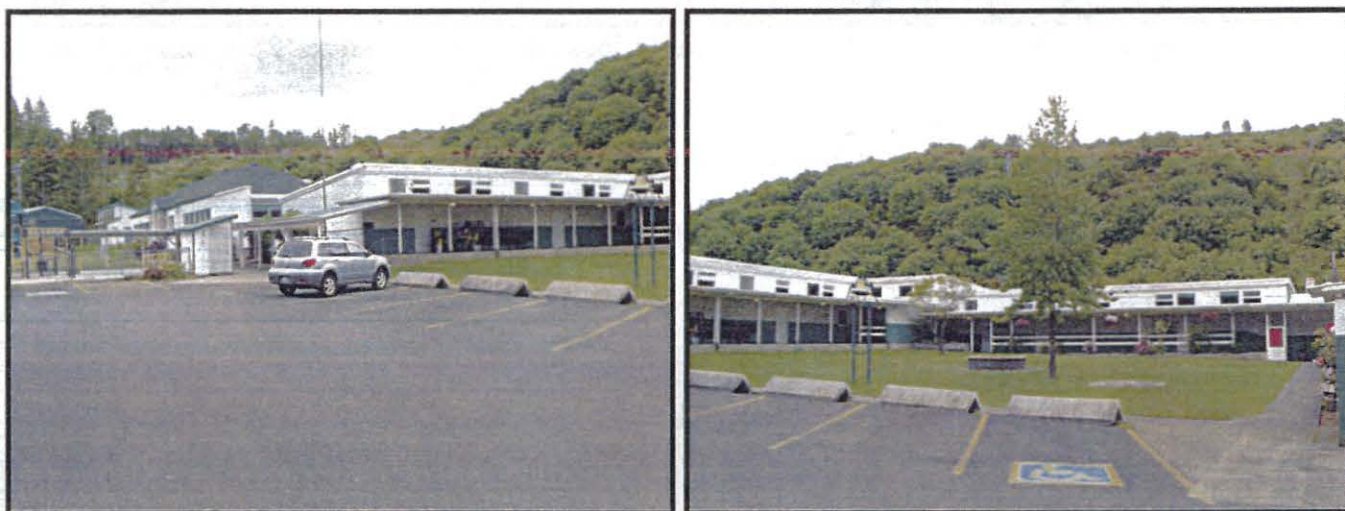
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No timber representatives were present during the visit to the Triangle Lake School (K-12) which lays adjacent to a 50 acre Weyerhaeuser Unit that was clear cut in 2008 (see **Figure 13**). The school owns a thin 8 acre forest strip that runs along Weyerhaeuser's 50 acre unit. With the schools consent, Weyerhaeuser cut, harvested, and replanted the thin buffer at no charge. Because parental concern over the proximity to the school, Weyerhaeuser hand sprayed the unit and ODF agreed to let the community use "Manual Release" (hand pulling/saws, etc.) to attain "Free to Grow" in 6 years.

Unfortunately, due to a miscommunication and/or a lack of follow-up by the community members responsible for the activity, there was a failure of the "Manual Release" project which resulted in competing species overcrowding the planted fir trees (see bushy big leaf maple trees in **Figures 14** and **15**). Technically, the strip could be in violation of Oregon's FPA if it is not "Free to Grow" in 6 years.



Figures 14 and 15. Triangle Lake School buffer zone with big leaf maple shading out the planted Douglas fir.

iii. Summary of Major Concerns and Issues. During the tour, ODA, ODF, and the timber representatives shared their concerns and thoughts about pesticide applications in Oregon's forests. The below list attempts to capture those heard by EPA during the tour:

ODF/ ODA

- State Governments must function within the limits of the FPA.
- FPA only provides buffers to protect soil, land, air or water, but not people or their homes. In the early 1990's, buffers for homes were removed by the state courts because ODF does not have jurisdiction over protecting human health. Although ODA does, they have not enacted buffers for residences since the provision was removed from the FPA.
- ODF budget cuts for the coming years (9% for FY11 and 12) are expected to strain an already tight program, further limiting their ability to respond to pesticide complaints.
- Limits of the Notification process:
 - They are NOT permits.



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- They do NOT require the exact application date or actual list of products used. Foresters can enter a date range (from 2 to 4 or more months) and list all products that they MAY apply (can list 10 or more possible chemicals).
- Some Notifications may contain Confidential Business Information which cannot be released to the public.
- Notifications were initially created to provide a mechanism to inform ODF of forestry operations near sensitive sites in Oregon and were never meant or structured to be used by "subscribers". Oregon legislators subsequently created a "subscriber" system whereby anyone who wanted access to the Notifications could purchase them for specific areas.
- ODF and ODA can't require foresters to release actual applications records to public.
- No other forestry community in Oregon has such a heightened concern over the use of pesticides.
 - Land use zoning could add to the issue by allowing residences to encroach in traditional forestry areas
 - This area produces the greatest amount of timber products in the country resulting in increased activity and pesticide applications.
 - Cultural differences may accentuate perceptions and sensitivity towards pesticide use.
- ODF and ODA are frustrated that people claim that the agencies don't respond to complaints.
- When the agencies do respond, it's often the case that they lack the proper jurisdiction or ability to address the specific concerns.
- ODF and ODA have directly observed many pesticide applications near concerned residents but have not found them to be problematic in terms of adverse impacts or in violation of State pesticide or forestry rules.
- ODF and ODA do not believe that claims of pesticides moving long distances from application sites (e.g., 1 – 2 miles) are credible.

Timber Companies

- Drift management has greatly improved over the last 30 years due to:
 - Ear to Ground communications where pilot and ground crew are always in direct communication.
 - GPS guided and recorded helicopter flight paths.
 - Split boom capabilities.
 - Applications being very site specific and using the least amount of chemicals possible.
 - Applications being audited frequently through self, third party contractors, and ODF.
 - Significant training by employees who are licensed applicators, even though they do not apply the pesticides themselves.
 - Company representatives being present for all applications to observe third party contractors who apply the products.
 - Applying pesticides only in the right "window of opportunity" which can result in applications occurring several days in a row.



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- Awareness of local weather conditions including temperature, precipitation, inversions, wind, etc.
- Not flying in fog. It was noted that fog may be in valleys but not where the actual application occurs.
- They are bound by the FPA and must:
 - Replant with 2 years of harvest,
 - Reach "Free to Grow" in 6 years of harvest, and
 - Leave 2 full trees per acre plus snags on clear cuts larger than 25 acres.
- Plots are only sprayed 2-3 times per 40-50 year harvest.
- Required to control noxious weeds along roadsides and in forestry units.
- Economics also require foresters to knock down competitive weeds, brush and trees.
- Notifications cause miscommunication with subscribers:
 - Forester must list all potential pesticides products they might use or else submit new Notification if product is not on original form.
 - Can't list exact date due to weather, pest pressure, site conditions, availability of pesticide applicator, etc.
 - Must identify larger area on Notification map than may actually be spraying.
 - Must identify the entire block on Notification if even just performing a spot-spray or roadside application, thus subscribers could believe entire area will be sprayed.
- Need to develop a trust relationship with the concerned citizens:
 - Try to provide application records when requested by public,
 - Cultural issues are huge barrier to trust relationship,
 - DO NOT want to jeopardize neighbors' health or property.
- Public may not understand that many aerial flights are not applying pesticides, but due to reconnaissance, applying fertilizers, etc.

b. Day Owen, Pitchfork Rebellion and invited participants (June 17, 2010).

i. Participants:

EPA

Chad Schulze
Erin Halbert
Allan Henning

Pitchfork Rebellion

Day Owen
Gary Hale
Mia Gee
Gail Henry
Plus many other members invited by Day Owen

Other Participants

Stuart Turner

ii. General description of tour. Day Owen organized the tour to illustrate his views that the unique characteristics of the area can increase the potential for aerial applied pesticides to drift off target. The trip was divided into a road and a virtual tour. The road tour visited six sites where pesticide drift has been an issue (see **Figure 16** for aerial view of sites). The virtual tour was held at a residence in Deadwood where Stuart Turner, an Agronomist, presented his views of how the climatic and topographic factors in the area increase the potential for drift.



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Congdon Creek

EPA met Day Owen, the Pitchfork Rebellion members and other participants the morning of Thursday, June 17, 2010, at the Low Pass Dinner in Cheshire, Oregon. After introductions, the tour group headed to the first site, Congdon Creek (see **Figure 17**). As illustrated in **Figures 18** and **19**, the slope on one side of the road had been clear cut and the valley floor on the other is a private residence. Day Owen mentioned that Congdon Creek is a salmon bearing stream and many of its tributaries drain the clear cut slopes that are sprayed with pesticides. Mr. Turner explained that foresters typically spray clear cuts two or three times per 40 – 50 years and that the spray seasons are typically spring and fall. He pointed out the steep slopes angling towards the road and tributary (in small valley shown in Figure 18) and noted that pesticide applications were made right up to the road and tributary as indicated by lack of competitor species.

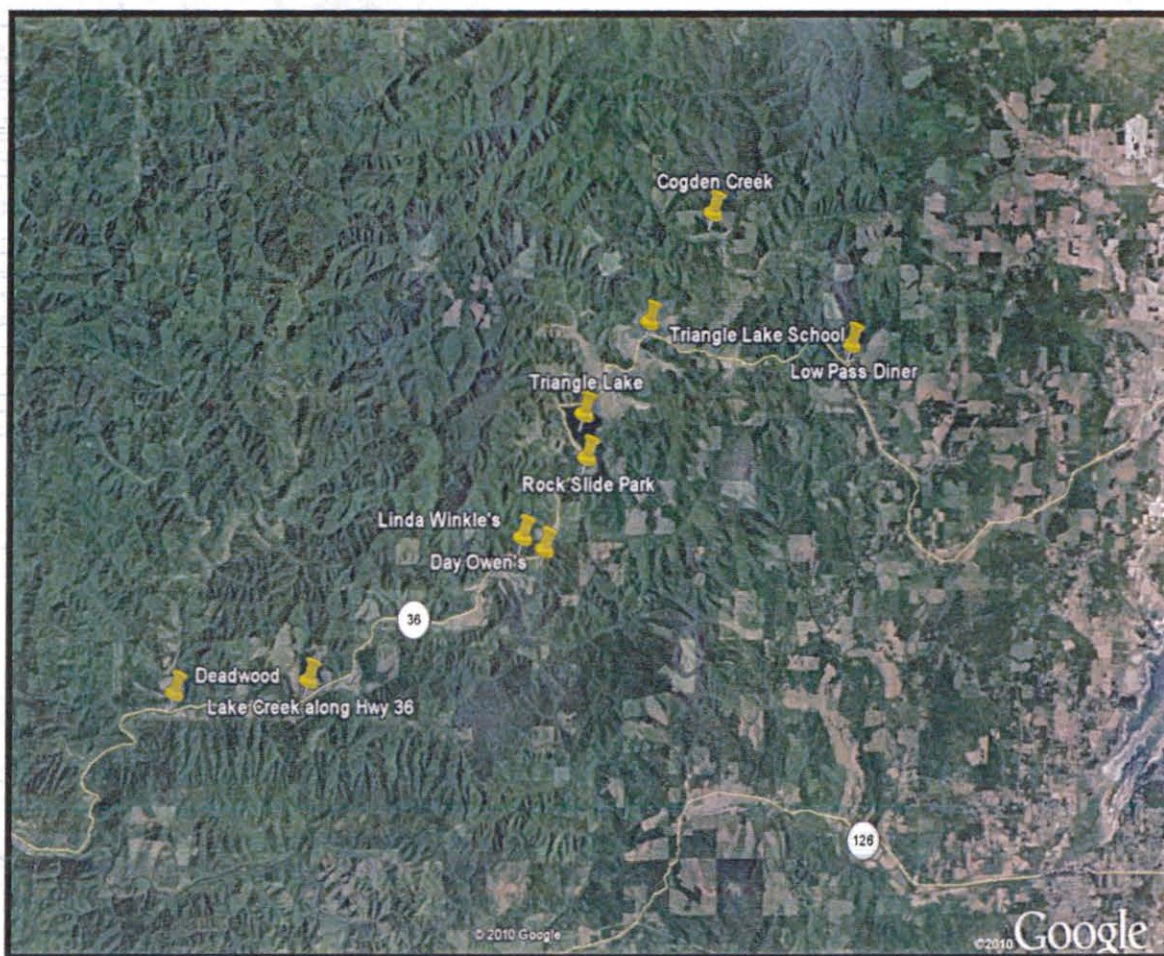


Figure 16. Sites visited during the tour with Day Owen.

Mr. Turner questioned the ability of the pilot to keep the pesticides on the target site while flying the steep slopes and avoiding the snags, wildlife trees, and boarder trees (see Figure 18).

Mr. Turner stated that the current, limited drift label language for these products is based from a 20 million dollar study conducted by the Spray Drift Task Force (composed of 42 pesticide companies)



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which reviewed aerial applications on flat land row crops with boom elevation heights of around 10 feet. Mr. Turner pointed out that the conditions in Oregon's coastal mountains or any mountainous region are significantly different from the conditions this label language is based on.

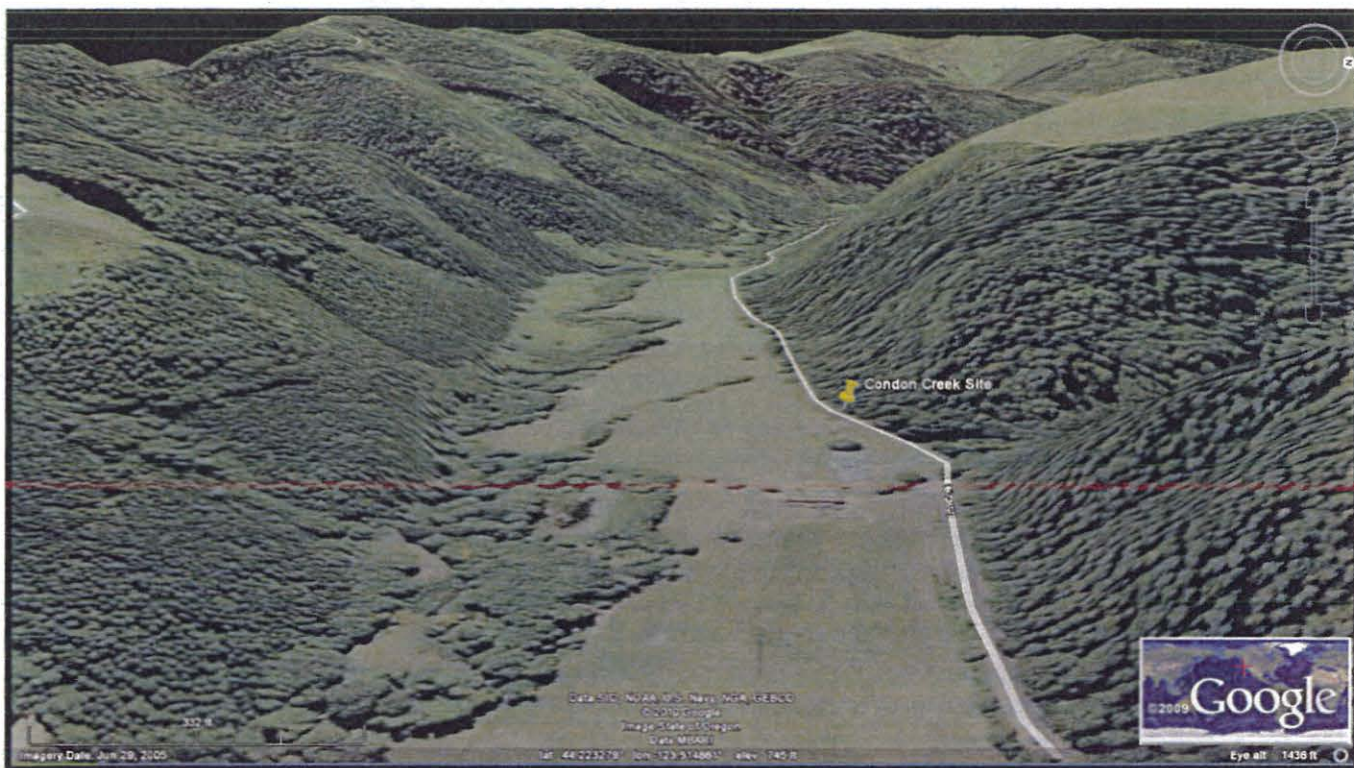


Figure 17. Congdon Creek site (Note: GEP aerial photograph was taken before unit was cut. GEP also spelled Congdon Creek "Condon Creek").



Figure 18 and 19. Congdon Creek unit. Left picture shows wildlife trees and boarder trees. Right picture shows proximity of the clear cut to the road and private property.



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Gary Hale stated that they were also concerned about the Oregon Department of Transportation's roadside applications along Hwy 36. He provided a package addressed to Scott Downey, Manager of the EPA Region 10 Pesticides and Toxics Unit, containing records from June 14 and 15, 2010 roadside applications along Hwy 36 (**Attachment 7**). Also included in the package were labels and Material Safety Data Sheets (MSDSs) for the products sprayed (Milestone, EPA Reg. No. 62719-572, and Phase, an antifoaming agent).

Triangle Lake School

Day Owen brought EPA to the Triangle Lake School (see Figures 11-13) to illustrate their concern about how close these application can be to people and children. Owen explained that the school was forced to cut the trees in the 8 acre strip between the school and Weyerhaeuser's 50 acre unit due to possible risks of blow downs. Since the back 50 acre Unit would be cut, the trees in the 8 acre strip would be exposed to stronger winds and more likely to blow down. Owen mentioned that the community had stepped up and agreed to manage the school's forestry strip via "manual release" instead of by traditional chemical means. At the time of the tour, Owen stated the strip looked green and healthy, though, in a subsequent editorial, Owen acknowledged that the "manual release" effort failed due to miscommunications between members of the community.

Owen also mentioned the group's belief that there was a high rate of cancer at the school and that 2 out of the 5 graduating male seniors had acquired testicular cancer and died

Triangle Lake

Triangle Lake is about 400 acres in size and is the headwaters of the salmon bearing stream, Lake Creek. The tour stopped for a brief visit at Triangle Lake Park on the west edge of the lake (see **Figure 20**). From this vantage point, Triangle Lake Ridge, which overlooks Weyerhaeuser Fish Creek Unit #1, is directly east across the lake. Owen stated that the timber companies log and aerially apply pesticides right up to the lake. He pointed out that the home below the clear cut in **Figure 21** was "hit" (drifted on) by pesticides when the clear cut was sprayed and expressed concern over the proximity of these spray operations to residence in the area and to surface water that is used for recreation, irrigation, and sometimes drinking. See **Figure 22** for distances between residences Owen highlighted and the clear cuts where spraying operations have occurred.



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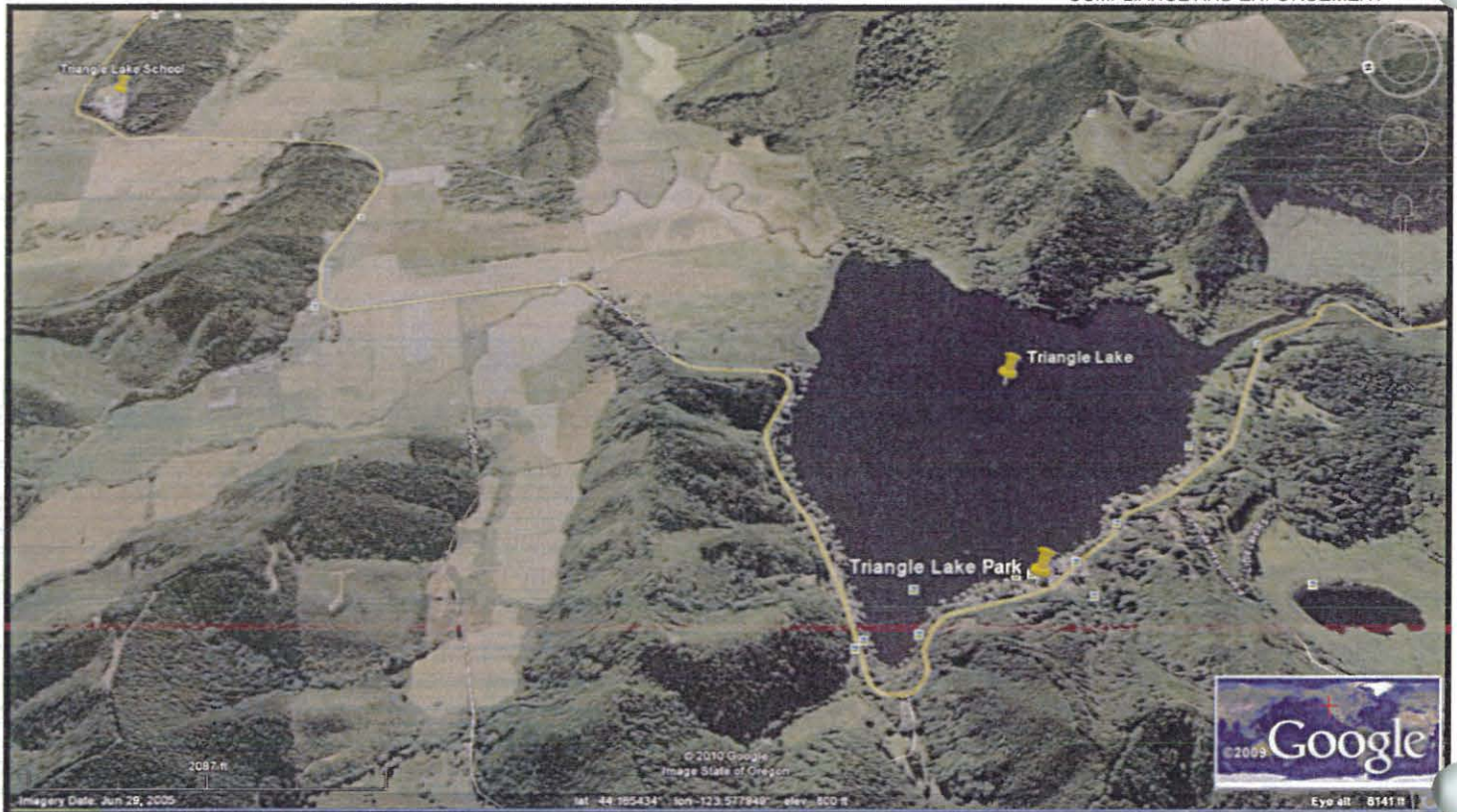


Figure 20. Location of Triangle Lake Park.

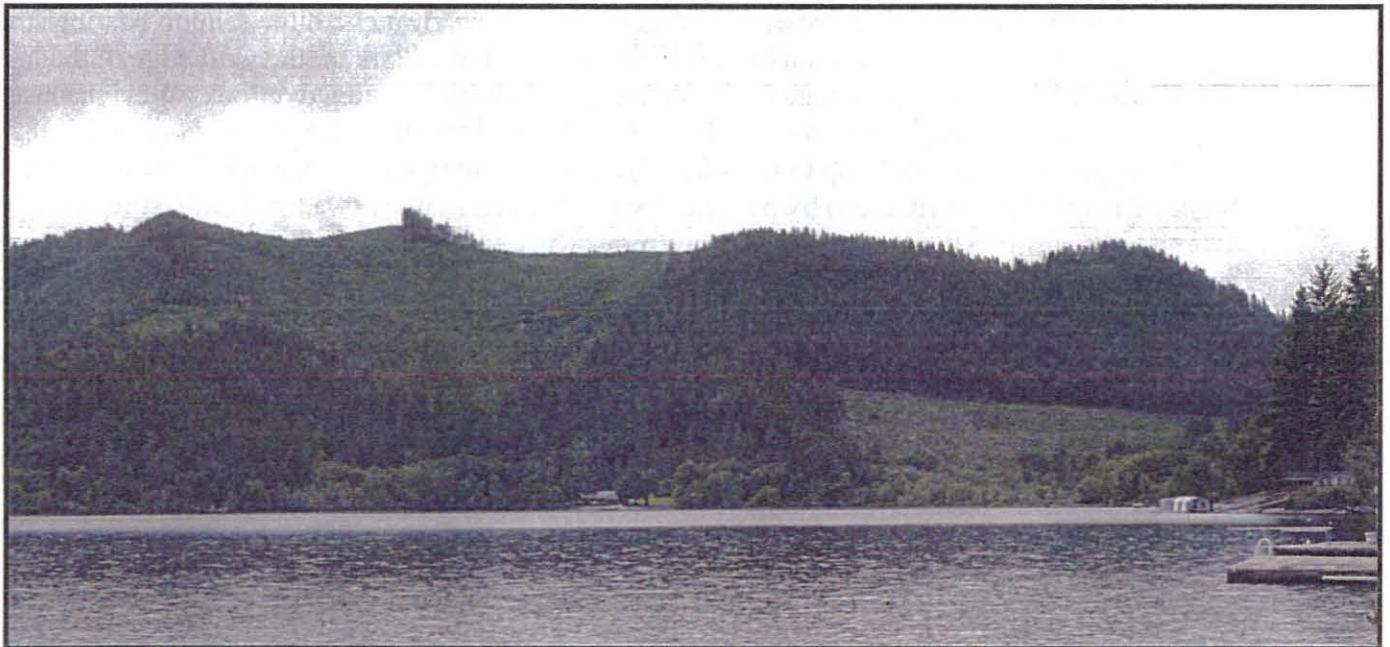


Figure 21. Clear cuts on the East edge of Triangle Lake.



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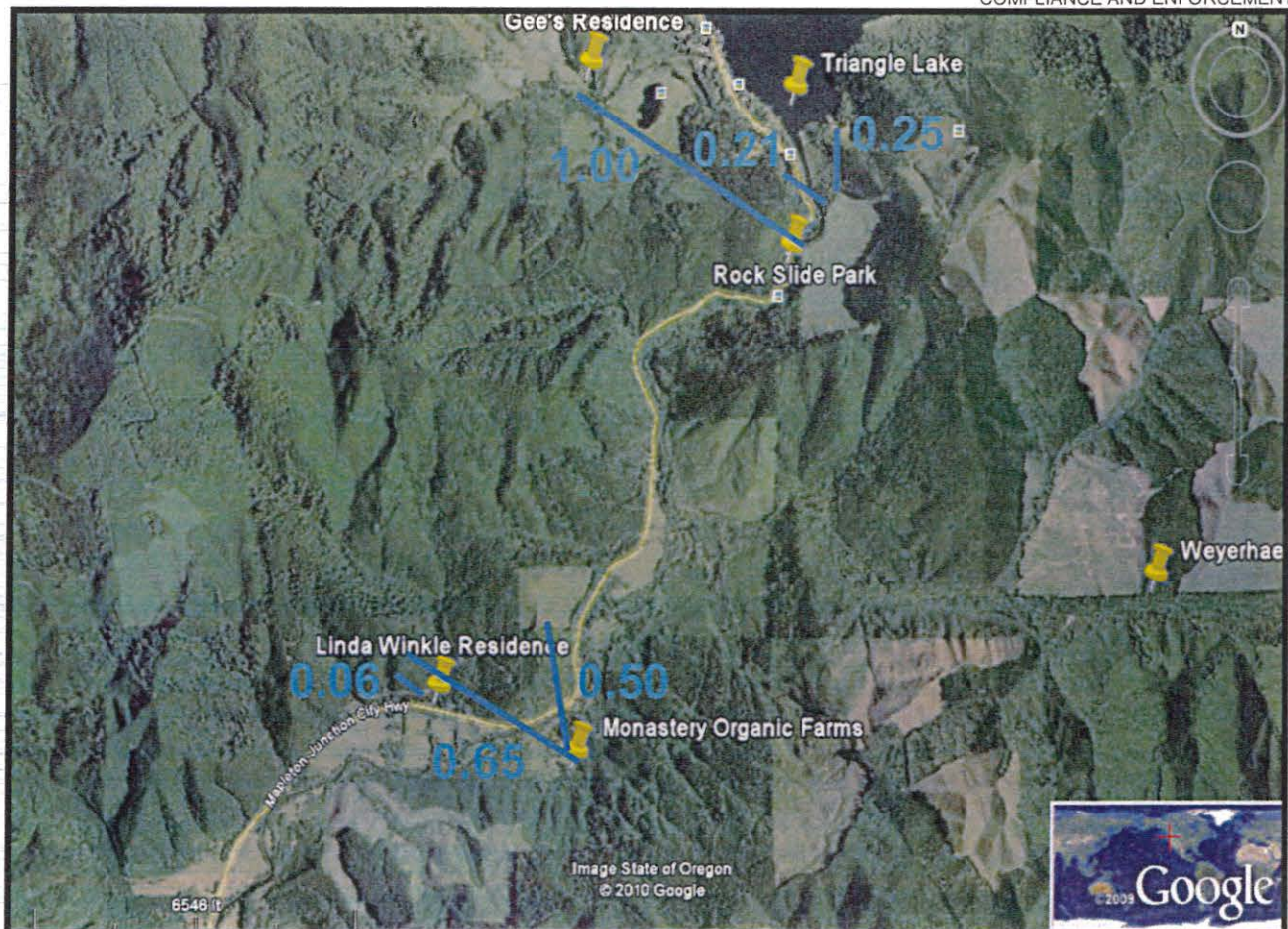


Figure 22. Distances between residences Owen highlighted and spray operations.

Rock Slide Park

Owen stated that about 2 years ago the timber companies clear cut the unit above Rock Slide Park all the way down to the creek edge, though, **Figure 23** appears to show a riparian zone between the clear cut and Lake Creek. Owen stated he wanted to show EPA how steep these slopes are in this area. Turner estimated the slope at around 70 degrees at the top of the ridge (see **Figures 24** and **25**). Again, Turner questioned how aerially applied pesticides could remain on the target site with such steep topography.

Turner also mentioned a 2001-2002 ODOT roadside application that he said drifted into Lake Creek at Rock Slide Park. Turner stated he had photographed foam in the water after the incident and would provide those photos to EPA, but as of the date of this report, those photographs have not been provided. Owen stressed that children play in this creek.



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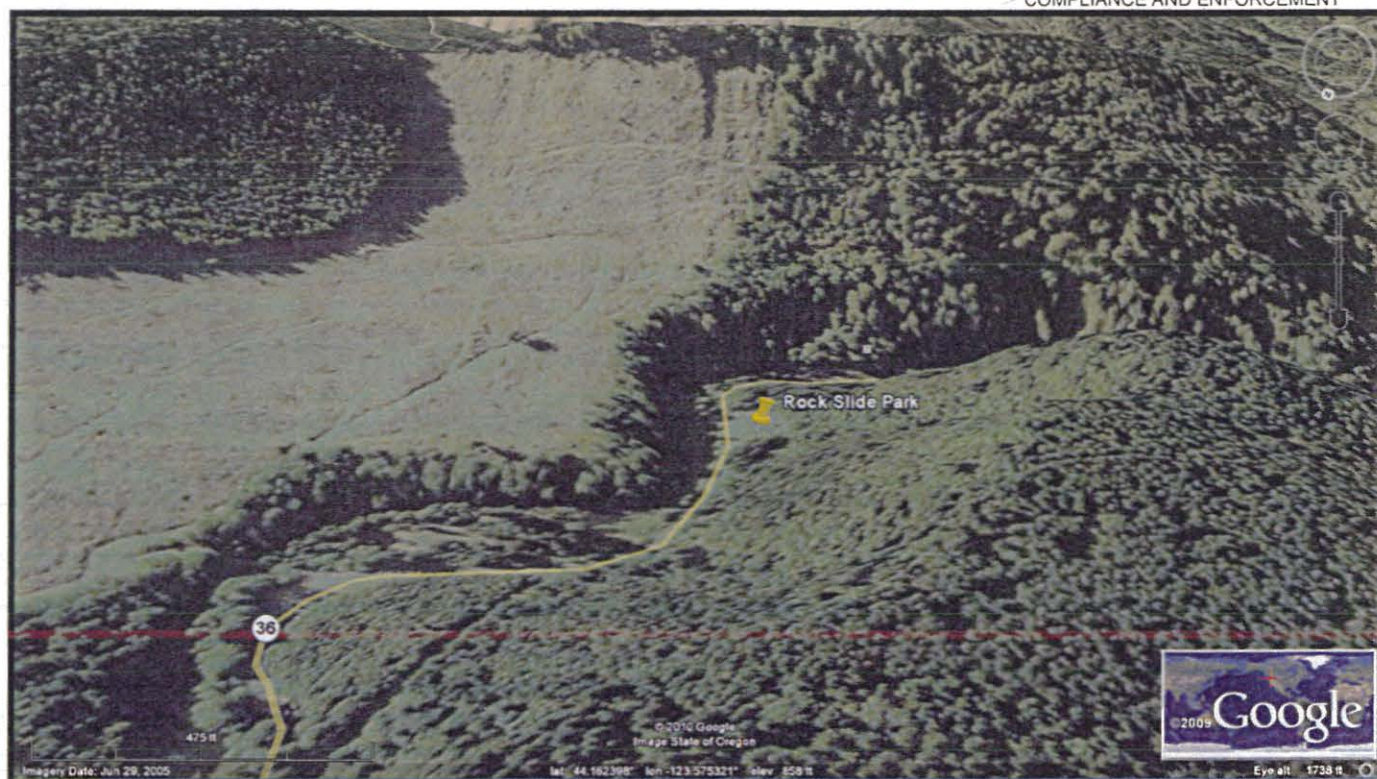


Figure 23. Clear cut above Rock Slide Park. Triangle Lake is visible in the lower left hand corner.



Figures 24 and 25. Clear cut above Rock Slide Park with ~ 70% slopes.



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Monastery Organic Farm

Owen then showed EPA the conditions around his home and organic farm, Monastery Organic Farm. The farm is 35 acres and lays about ¼ mile from any active clear cut, though Weyerhaeuser owns a large unit on the hills to the south behind Owen's farm (see **Figure 26**).

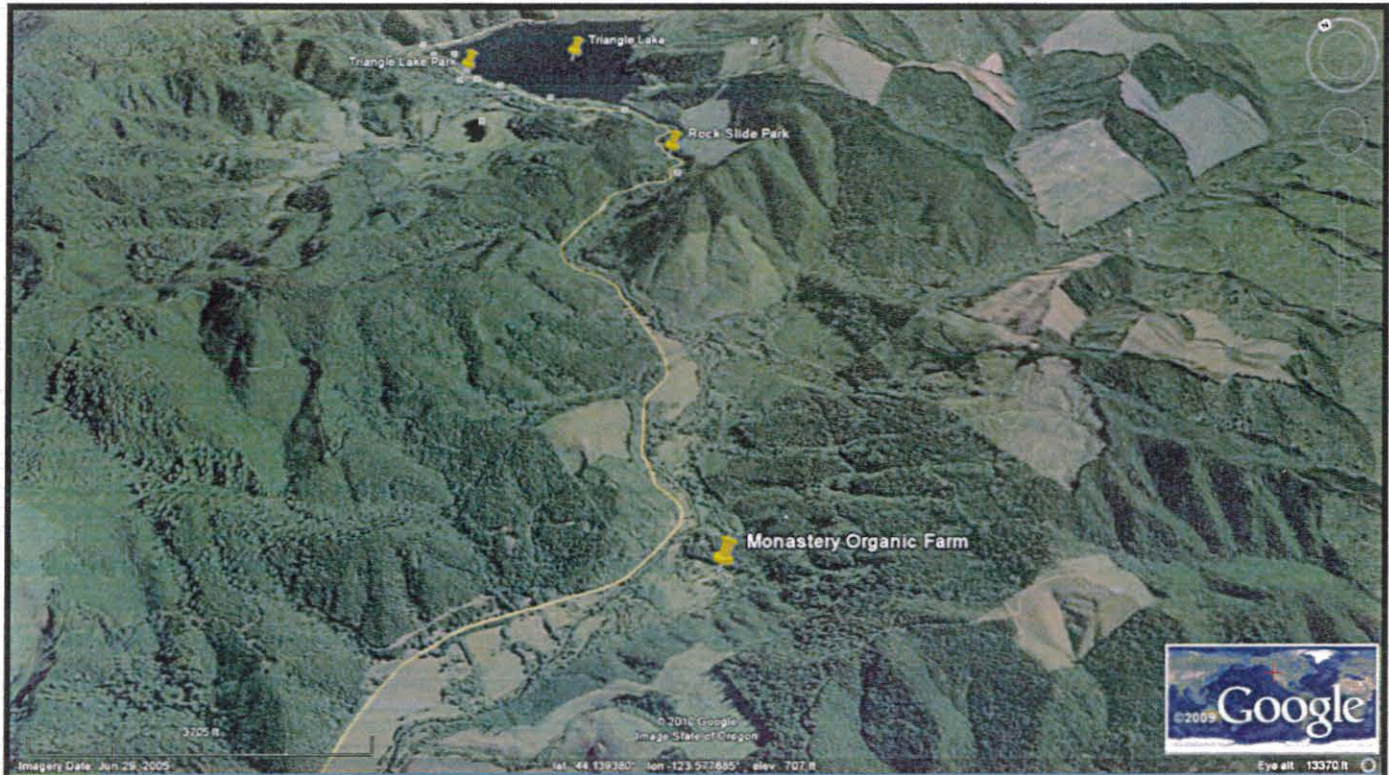


Figure 26. Location of Day Owen's farm. Monastery Organic Farm.

Owen pointed out the wisps of fog on top of the hills to the west of his property and stated that he and his daughter had become ill after an application to those units (see **Figures 27 and 28**). According to Owen, the doctor that treated his daughter stated that the symptom's appeared to be related to pesticide exposure, though the Pesticide Analytical Response Center (PARC), the agency in Oregon charged with investigating the relationship between pesticide exposures and illnesses, determined there was no known pathway because of the distance from the application. He stated that he had provided the medical records along with the original Petition.

Owen explained that that in the fall and spring, the valley fills with morning fog that rises up the hills as the weather warms and then settles back on the valley floor in the evening bringing the pesticides along with it. The Pitchfork Rebellion members expressed concern about the volatilization of the pesticides and the subsequent movement of the pesticide off target via transport in the fog. Turner suggested that EPA review studies conduct by Dr. James Seiber of UC Davis on transport of pesticides through fog. According to Turner, Seiber's work illustrates the potential for drift in these moist, cloudy, coastal mountain zones. Owen stated that he has never seen visible plant



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damage on his property that he could attest to pesticides. Turner stated that you will not always see visual evidence of these products moving off target. He referenced published articles from France that found fruit trees could have a 90% fruit reduction without visual symptoms of exposure.



Figures 27 and 28. Forestry units viewed from Monastery Organic Farms with wisps of fog/low laying clouds.



Figure 29. A small tributary to Lake Creek running through Monastery Organic Farm.



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Owen also pointed out a stream running off the hills to the south of his property that he uses to water the organic farm and noted that he previously used it for domestic water before changing to a well water system. The stream is hardly discernable amongst the tall prairie grasses (see **Figure 29**) and is a tributary of Lake Creek. Owen questioned how pilots avoid spraying these small tributaries when they are barely noticeable from the ground.

Linda Winkle's Property

Roseburg Forest Products Company (Roseburg) manages the unit directly to the northwest of Linda Winkle's property (**Figure 30**). Owen said that in 2004 Ms. Winkle's son had become extremely ill after an ODOT roadside pesticide application drifted through his window, while at the same time, an aerial application occurred on the Roseburg unit. Because of the son's condition, he said that Roseburg had switched to ground spraying on this unit.

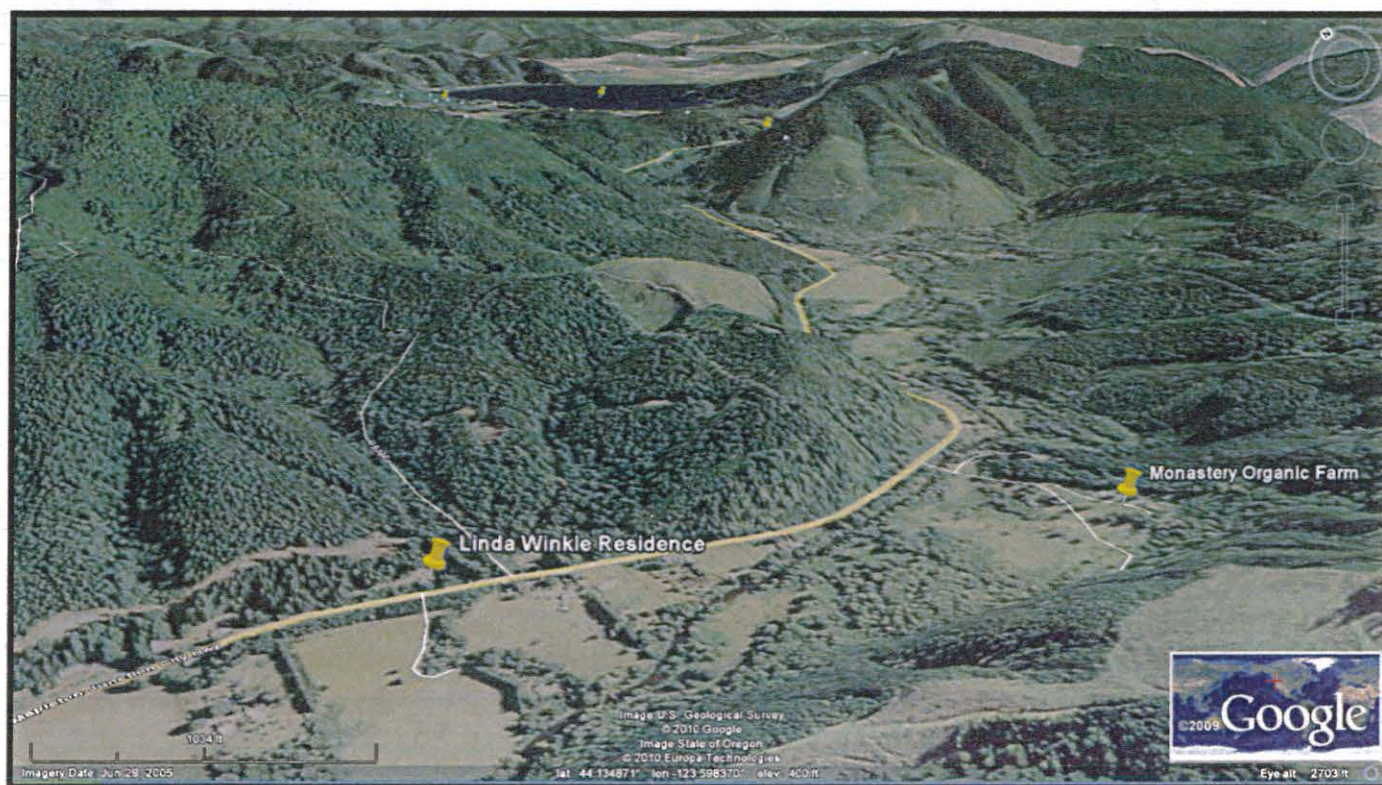


Figure 30. Location of Linda Winkle's residence.

Owen stated that Roseburg leased a strip of land to Ms. Winkle between her property and the forestry unit to provide a protective buffer. Prior to this land lease agreement, half of Ms. Winkle's garden was located on Roseburg's property (**Figures 31, 32, and 33**).

Ms. Winkle came out of her house for a few minutes and stated that Roseburg had notified her that they would ground spray the unit on June 21, 2010. She was unsure if the entire hill would be sprayed or just a selective "Hack and Squirt." She also stated that a Roseburg representative told her

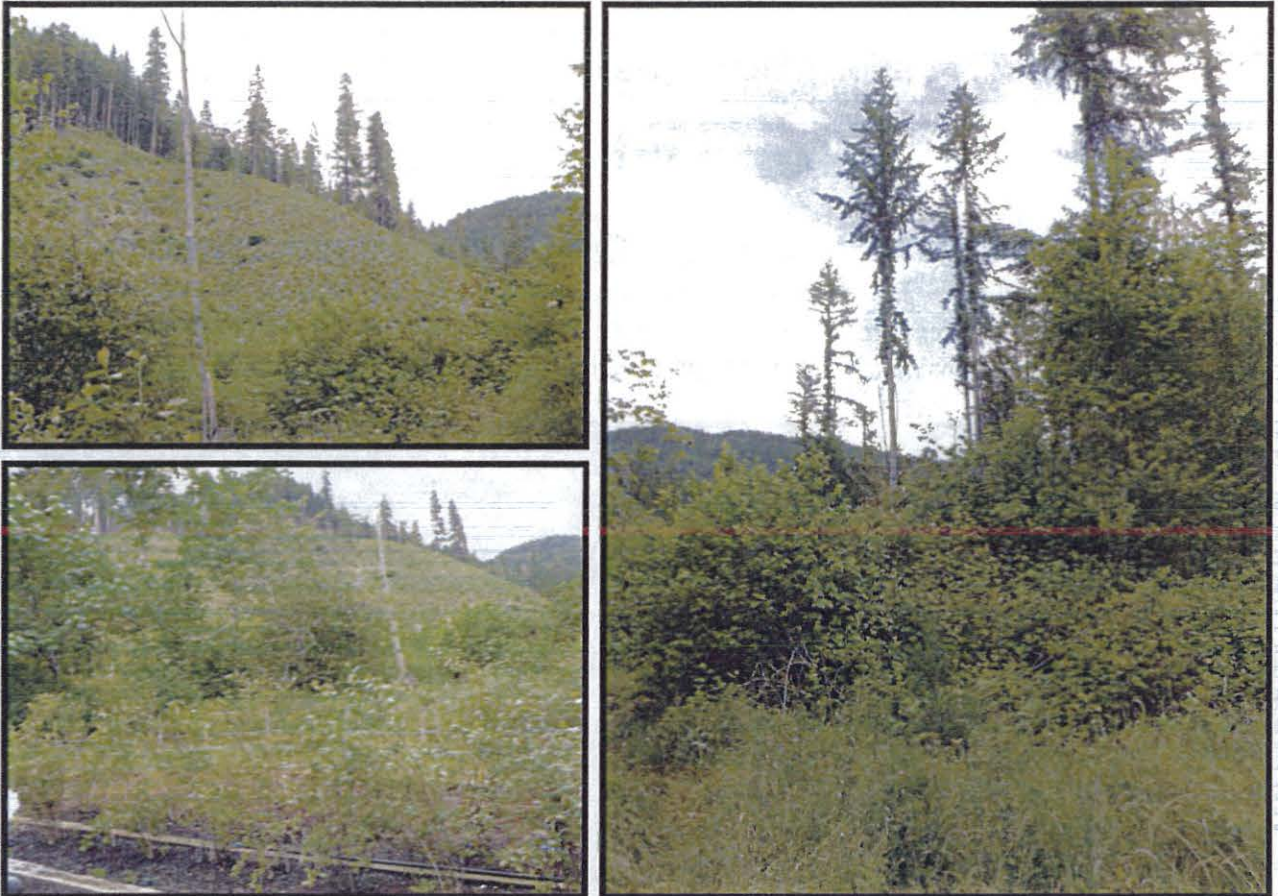


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that they must now use more dangerous (toxic) products to get the same control they would get from aerial applications.



Figures 31, 32, and 33. View of Roseburg clear cut and required wildlife trees from Ms. Winkle's driveway (31 – top left), garden (32 – bottom left) and edge of property (33 – right).

Turner discussed the difficulties in trying to aerially apply pesticides in this unit due to the combination of slope, snags, wildlife trees, and edge trees. A concern he expressed for most units on the tour.

Along Hwy 36

While driving to Deadwood for the virtual tour, Turner pointed out another example of a steep clear cut along Hwy 36 (see **Figures 34 and 35**). Turner stated that Lake Creek was right at the base of the hill and that there were several residences in the floor of the valley below the clear cut. Turner explained that at the height these pilots must fly to avoid snags and edge trees, the diurnal movement of air combined with the vertical dispersion of the product greatly increases the risk of drift. Turner suggested EPA engage in this issue and fund new studies to amend the current, limited drift label language for products used in mountainous terrain.



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Figures 34 and 35. Clear cuts along Hwy 36 just east of Deadwood.

Virtual Tour

The tour ended in Deadwood (see Figure 16) with a virtual tour of the area as illustrated through GEP and a presentation by Turner on conditions that favor drift in mountainous corridors (see **Attachment 8** for photographs referenced during the presentation and a video of the meeting provided by Amy Pincus Merrwin of Inform Media). Attempts to hold a web conference for EPA staff in Seattle and Washington D.C. failed but several EPA staff participated via conference phone. Present on the phone were; Scott Downey, Derrick Terada, Juliann Barta, and Linda Liu (from the Seattle Office) and Jill Bloom, Jeff Dawson, and Ashley Nelsen (from the Washington D.C. Office). In his presentation, Turner highlighted a 2009 case to the south of the Siuslaw Valley near Sutherland Oregon where a Viticulturist, Kevin Kohlman, claimed his crop was severely damaged due to pesticide drift from aerial pesticide applications by Roseburg. During his discussion, Turner suggested the following issues greatly increase the potential for pesticides to drift from the target site:

- Topography and slope – in this case, slopes were 65 degrees with a 1,100 foot change in elevation.
- Vertical dispersion of product.
- Height of release – due to edge trees, wildlife trees, snags and slope.
- Diurnal movement of air.
- Fog and cloud layering – often multiple layers moving in different directions
- Inversions.
- High doses – forestry rates are 3 to 20 times the rate used for the same compounds on agricultural crops (3 -5 oz per acre compared to .3 oz per acre).
- Droplet size (smaller droplet sizes increase potential for rotor wash).
- Nozzle maintenance and replacement.
- Weather changes over the slope of the unit (ridges have increased wind speeds and 95% of the access points to these units is on top of a ridge.



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- Direct application of pesticides onto snow.
- Chemistry of hard water and pesticides may effect movement of product.

Turner finished the discussion by referencing Battelle Labs' findings that aerially applied pesticides in the Horse Heaven Hills near the Tri Cities in Washington State drifted up to 22 miles from the site of application due to the special local conditions of the region. He purposed that this region also has special conditions that could result in similar movement of product from the target site.

At the end of the virtual tour, Eron King provided videos she took of applications in the area (**Attachment 9**) and Amy Pincus Merwin provided a May 13, 2010, email addressed to Scott Downey, requesting EPA consider conducting epidemiological studies in areas around the Siuslaw Valley (**Attachment 10**).

iii. Summary of Major Concerns and Issues. During the tour, the group shared their concerns and thoughts about pesticide applications in Oregon's forests. The below list attempts to capture those views heard during the tour:

- The valley is exposed to numerous pesticides through applications on forests, agriculture, and roadsides.
- No studies have been conducted to determine the effect (human or environmental) of all these applications occurring in one watershed /valley.
- What concentration of this mix of products will affect human health?
- No studies have been conducted to determine the effect of applying 3 to 4 pesticides in the same tank mix (label rates are base per product).
- Salmon bearing streams line the valleys – Triangle Lake is the headwaters of Lake Creek, a salmon bearing stream.
- Organic farms are located throughout the valley.
- Need buffers to protect people as well as animals (concerned home buffers were removed from the FPA).
- Oregon's Right to Farm Act is a barrier to creating buffers for homes.
- The FPA only allows a certain acreage to be cut at one time, thereby creating many clear cut patches that need to be sprayed every year.
- Want EPA to engage in the issue and do the research on these products in regards to the specific conditions of this area.
- Labels:
 - Currently, label language does not adequately address local conditions and therefore applicators can not keep the products on the target site.
 - Current label language is based on extremely limited data obtained by the Spray Drift Task Force – a group of 42 pesticide industry interests - and the 20 million dollar study conducted by the Spray Drift Task Force involved less passes (fly overs) than a typical 200 acre forest application.
 - Pesticide applications are occurring on slopes between 50 and 70 degrees – how does EPA expect these products to stay on target?
 - Need label changes to address these conditions.



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- Very concerned with spraying pesticides in fog and the resulting transport from the target site.
- Many streams in the area are used for domestic drinking and gardens:
 - Are these pesticides getting into surface and ground water (drinking wells)?
- Concerned with the close ties between ODF, ODA, and the timber industry – how can we trust them?
- Need to build a trust relationship with ODF, ODA, and the timber industry.
- EPA should shift responsibility of heading PARC from ODA.
- ODF and timber industry do not provide specific information about applications when requested by the community – they do not respond.
- Notifications:
 - Need better information for subscribers such as more accurate dates and list of products used.
 - What levels of streams are reported out through the notification process?
 - Is this stream data up to date?
- Asthma, nervous disorders, and many other health issues experienced by the community have been caused by pesticides.

c. Kevin Kohlman's Vineyard (June 17, 2010)

i. Participants:

EPA

Chad Schulze
Erin Halbert
Allan Henning

Other Participants

Kevin Kohlman

ii. General description of tour. The Kohlman vineyard is about 50 miles south of Eugene and 10 miles west of I-5 (see Figure 1). The vineyard is located on a high plateau (about 1,100 feet) nestled against a higher ridge directly to the west (see **Figure 36** and **37**). The ridge rises about 1,400 ft above the Kohlman vineyard (to about 2,500 ft) and runs about 6 miles north to the Elkton-Sutherlin Hwy.

Kohlman owns 99.98 acres but only farms a small portion of the total acres. The vineyard has upper and lower fields (see **Figure 38**). Kohlman showed EPA around his vineyard and pointed out where he believes the vines have been damaged by exposure to pesticides. According to Kohlman, the damage stems from a spring 2005 drift incident from the Roseburg unit directly above his farm called the Tyee Resource Unit (see **Figures 39, 40** and **41**). This unit is just over a quarter mile from the lower vineyard and is sloped and funneled toward the Kohlman property. The Tyee Resource unit average slope is about 65 degrees. See **Figure 42** for a cross-sectional view of the distance between the Kohlman vineyard and the Tyee Resource Unit and **Figure 43** for a straight on view showing the lower vineyard and the Tyee Resource Unit. Kohlman provided a map that shows the distance from his farm to the Tyee Resource unit and five others - Valley Sandwich, Lost Bottle,



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Bottle Caps, Tyee Sandstorm, and 3 Mile Lost Forde (see **Attachment 11** and **Figure 44** for distances provided in GEP).



Figure 36. Location of the Kohlman vineyard.



Figure 37. Kohlman's upper vineyard with high ridge in background.



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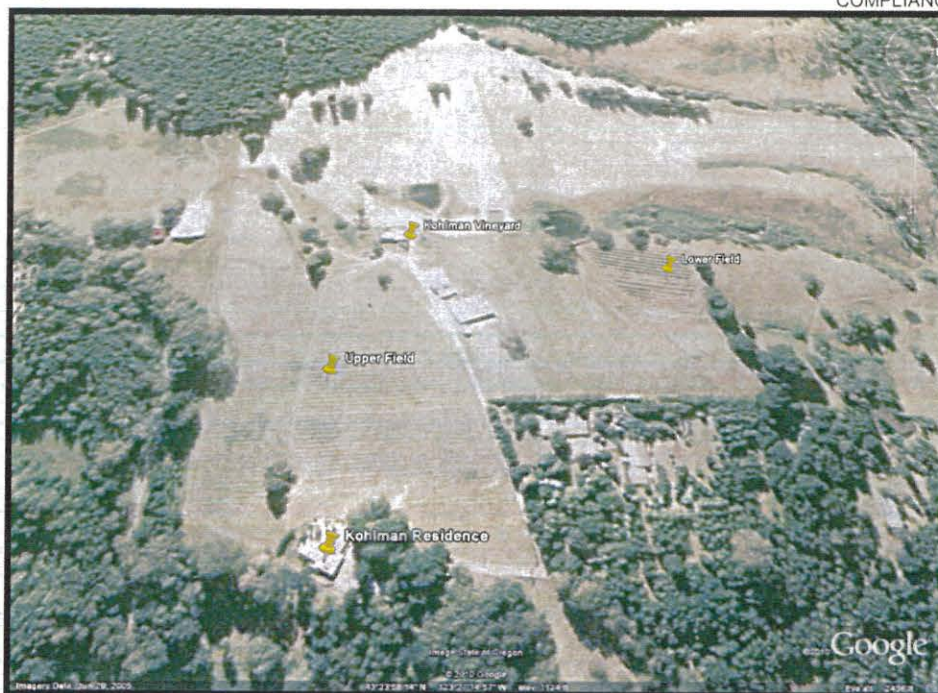


Figure 38. Aerial view of the Kohlman vineyard. Note the upper and lower fields.



Figure 39, 40 and 41. The Tye Resource cut from Kohlman's upper vineyard (39 –left) with magnified photos (40 –top right and 41 – bottom right).



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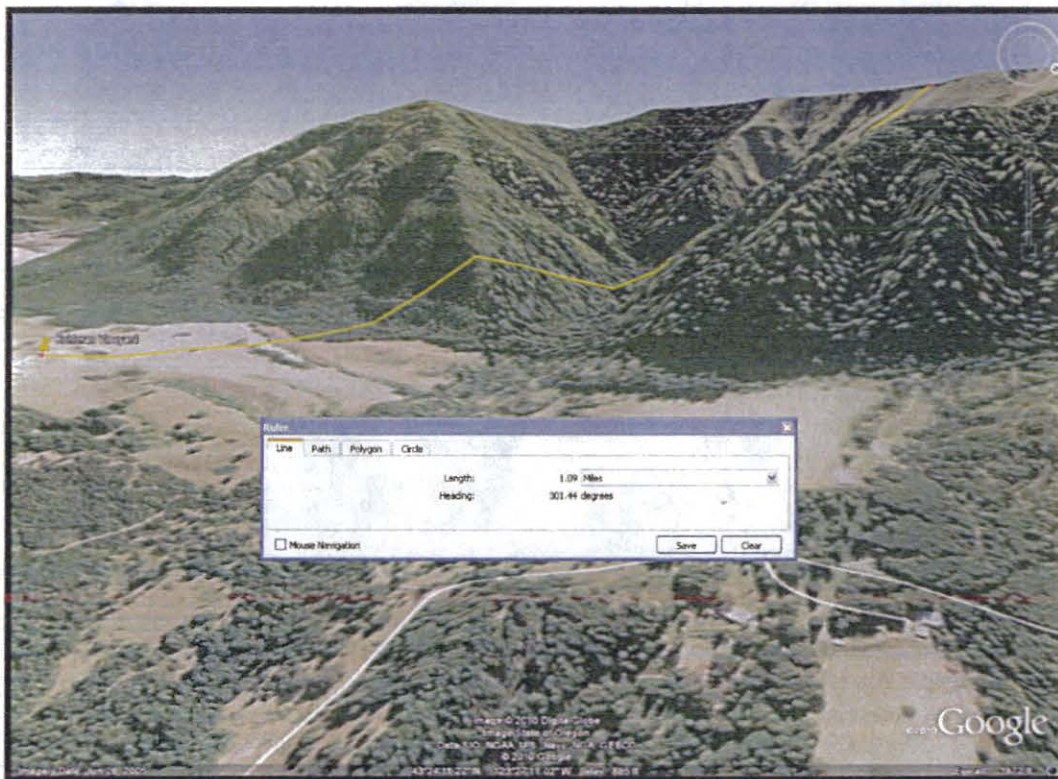


Figure 42. Cross-sectional view of distance between the Kohlman vineyard and the Tyee Resources Unit (as measures from the farm to the top ridge of the unit).

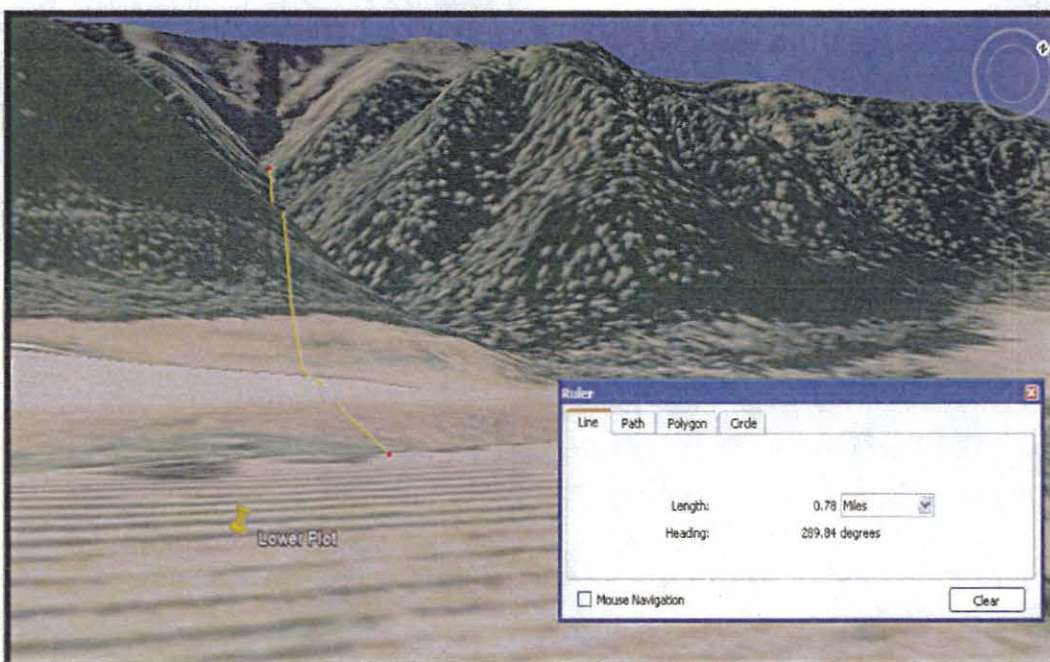


Figure 43. Straight on view showing the lower vineyard and the Tyee Resource Unit (Source GEP).



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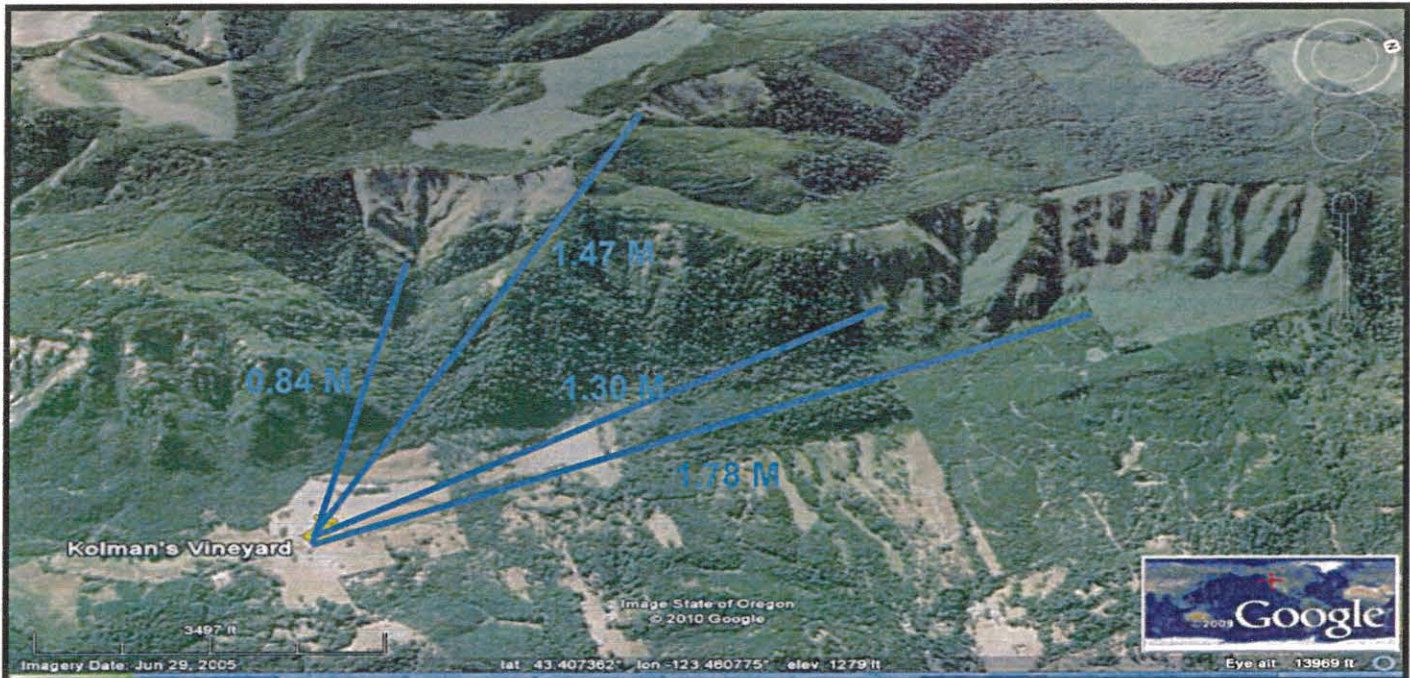


Figure 44. Distances between the Kohlman vineyard and several forestry units in the vicinity.

Kohlman pointed out the Valley Sandwich clear cut just over a mile to the north of his farm (**Figure 44** and **45**) which he was also concerned with since 95% of the time the prevailing winds flow from this unit and Tyee Resources right to his farm. Kohlman believed the defoliation patterns in his vineyard indicated that pesticides had drifted down the valley from these units with the prevailing winds.

At the time of the tour, Kohlman was in litigation with Roseburg regarding the alleged 2005 drift incident. He mentioned that evidence uncovered through the litigation process showed his pond by the lower vineyard had detectable residues of sulfometuron methyl, the active ingredient in Oust (EPA Reg. No. 352-601). Kohlman believes this is the reason why the vines nearest the pond show significant signs of damage (see **Figure 46**). Kohlman stated that he has lost over 3.5 million dollars in revenue due to the damage he sustained from the drift incident in 2005.

See **Attachment 12** for CD's of videos and photos relating to Kohlman's case. The CD's were provided by Turner after the Deadwood virtual tour.



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Figures 45 and 46. Forestry unit “Valley Sandwich” from a hill over looking the lower vineyard (37 –left) and damaged vines nearest the pond in the lower vineyard (38 – right).

iii. Summary of major concerns and issues. During the tour, Kohlman shared his concerns and thoughts about pesticide applications in Oregon’s forests. The below list attempts to capture those heard during the tour:

- Need significant changes in ODA and ODF.
- Timber companies in area all spray at the same time so it’s difficult to determine where drift originates.
- EPA must test and study drift in these unique conditions.
- EPA should limit the amount of pesticides used on forestry units near sensitive sites, such as vineyards.
- Studies show that the ester formulations of these herbicides can move over a mile. How does this affect the definition of “close proximity”?
- Steep slopes like that of the Tyee Resource unit are not accounted for on pesticide labels.
- EPA should review wind model studies conducted by Southern Oregon University SC (Dr. Greg Jones).
- Do the current labels allow applications to snow?
- Need to create a fund paid for by the applicators that would pay for environmental samples when there are allegations of drift – Kohlman has been paying for his own samples at \$5,000 per sample.



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d. Oregon Toxics Alliance (June 18, 2010)

i. Participants:

EPA

Chad Schulze
Erin Halbert

Oregon Toxics Alliance

Lisa Arkin

Other Participants

Art Paz
Everett Dormer
Karl Morgenstern
David Richey

ii. **General description of tour.** Lisa Arkin, Executive Director of the Oregon Toxics Alliance (OTS) requested that EPA visit the Weyerhaeuser Cedar Flat Unit to illustrate the unique issues regarding use of pesticides in this area. Arkin organized the meeting at the home of Art Paz, a resident of the area for over 42 years. She invited Karl Morgenstern, of the Eugene Water and Electric Board (EWEB), David Richie, of the Lane Council of Government (LCOG), and a nearby resident, Everett Dormer, who lives just below the Cedar Flat Unit, to participate in the meeting.

The Weyerhaeuser Cedar Flats Unit is about 10 miles due east of Springfield, Oregon (see Figure 1) and is a part of the McKenzie River watershed. The 34 acre Unit sits on top of Foot Hill at about 1500 feet elevation but is much less sloped than the sites visited in the Triangle Lake and Sutherlin areas (slope average is 5 to 10 degrees). The site was cut in late summer to fall of 2009. An attempt by Weyerhaeuser to spray the unit in April of 2010 was stopped by Paz and Everett when they blocked the road accessing the site.

Morgenstern presented EWEB's results from their Drinking Water Source Protection Program's Comprehensive Monitoring Project (see PowerPoint Presentation in **Attachment 13**). The project attempts to analyze water quality in several locations of the watershed during storm events. Morgenstern explained that the 2009 results found pesticides in small concentrations (ppt) even at the utility's intake (see Attachment 12 for specific pesticides and concentrations). At the time of the meeting, the 2010 results had not been finalized (for historical data past 2005 visit the website <http://www.mckenziewaterquality.org/> and click on "reports" at the bottom of the page).

EWEB's testing parameters follow the information obtained from ODF Notifications for the entire McKenzie River watershed. EWEB pays \$2,800 dollars a year in subscriber fees to get access to all the Notifications submitted for forestry operations in the McKenzie River watershed. The LCOG summarizes the data from the Notifications for EWEB (see **Attachment 14** for the *2009 Forest Spray Data Summary* provide by Richie).



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Figure 47. Location of the Cedar Flat Unit in relation to neighbors and sensitive areas (note: the GEP aerial photograph was taken prior to the unit being cut).

Paz provided an April 18, 2010, Petition titled *Weyerhaeuser Herbicide Spraying at Cedar Flat Unit* that was signed by the residence of Cedar Flat area. The Petition requests Weyerhaeuser to not use any synthetic chemical herbicides or pesticides on the 34 acre Cedar Flat Unit (**Attachment 15**). On June 18, 2010, (after the Cedar Flat visit) Dormer faxed EPA a Weyerhaeuser June 30, 2010, Open House Invitation to discuss the Cedar Flats Unit (**Attachment 16**). Dormer received the invitation on June 16, 2010. In the invitation, Weyerhaeuser states that they have received the petition and would like to address the people's concerns. EPA has not heard the outcome of the open house.

Arkin provide EPA a letter regarding Pesticide Spray in Forestry Practices (**Attachment 17**). In the letter, OTA offers EPA several recommendations to consider while reviewing the adequacy of current label language for use in timber stands. The recommendations range from restricting multi-year applications to establishing a Science Advisory Panel on the matter of aerial pesticide spray and pesticide drift in forestry practices.

After the meeting, Arkin and Dormer showed EPA around the Cedar Flats Unit. Dormer pointed out the proximity of the unit to Paz's home and organic blueberry field (**Figures 48 through 51**) and estimated the distance at less than 50 meters.

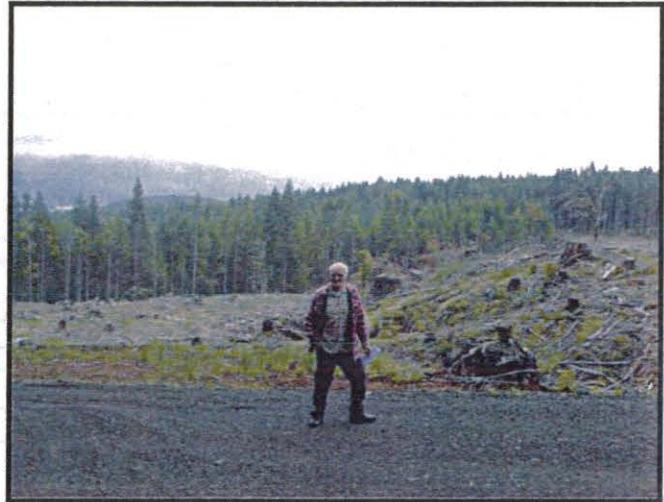


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Figures 48 and 49. The Cedar Flat Unit as viewed mid way down the Paz driveway (48 – left) and at entrance (49 – right).



Figures 50 and 51. Left photo: The west edge of the Cedar Flat Unit along the Paz property looking back down Cedar Flat Road towards the Paz driveway. The organic blueberry field is just beyond the tall trees in the top left of the photo. Right photo: The far end of the blueberry field looking into the Cedar Flat Unit.

Dormer pointed out his property from the top of the unit (**Figure 52**) and then lead EPA through his property to observe the spring fed pond 200 feet down slope of the clear cut (**Figure 53**).



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Figure 52. View from the top of the Cedar Flat Unit looking down onto the Dormer property. The Dormer property begins near the tree line.



Figure 53. Dormer's irrigation and domestic water pond. The Cedar Flats clear cut can be seen through the trees.



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Dormer stated that he mostly uses the water from the pond for irrigation but does use it occasionally for drinking water during extended power outages. The spring feeding the pond produces about 32 to 35 gallons per minute and is located about 30 meters into the Cedar Flat Unit (**Figure 54**).

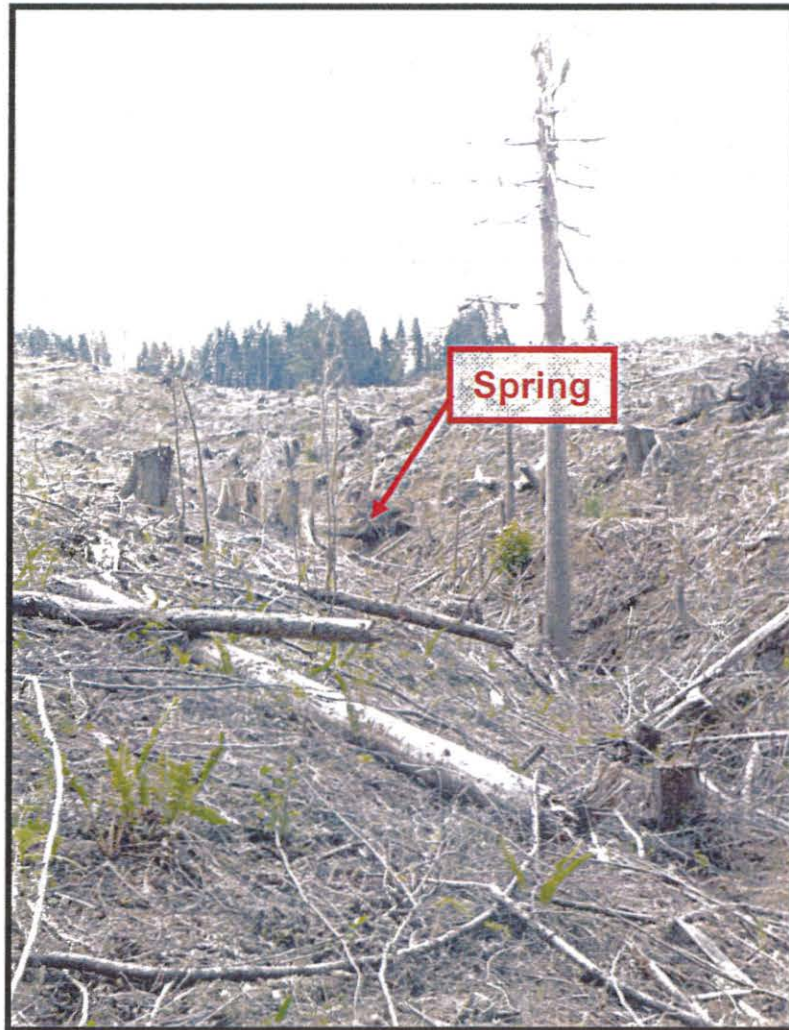


Figure 54. Location of spring in the Cedar Flats Unit. This photo was taken from the edge of the Dormer property.

iii. Summary of major concerns and issues. During the tour, the participants shared their concerns and thoughts about pesticide applications in Oregon forests. The below list attempts to capture those heard during the Cedar Flats tour:

- Data results show pesticides are getting into surface waters.
- 2009 data showed pesticides at utility intake (first time).
- These concentration are in the ppt but they have been significantly diluted by rain and drainage.
- EWEB Spends \$2,800 per year for ODF Notification subscriptions.
- Can't use pesticides in rural/industry inter phase.



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- Has EPA studied the risks of the tank mixes used by the timber industry?
- Local condition complexity needs to be integrated into registration process – need to look at microclimates.
- Organic farm 50 meters from clear cut – how can timber companies ensure product will NOT drift from target site?
- Grand children visit Paz's home and he stated he does not want to risk his grandchildren's health for Weyerhaeuser's "experiment".
- There is a school bus stop very close to the Cedar Flats Unit.
- Why do timber companies need to spray – Douglas Firs can out compete unwanted species (vine maple/big leaf maple) – Jeff Jankesy (OSU) may have studies on competition.
- Douglas fir is not the only tree of value.
- Concerned over contamination of drinking water.
- Many people have been living here longer than the timber industry.
- ODF is using old stream data.
- House Bill 2210 requires control of "pests" only in a way that protects human health and the environment.

IV. Summary

As stated at the beginning, this Trip Report was intended to convey information the EPA Region 10 Pesticide Program collected and observed during the tour of Forestry and Pesticide Use Issues in the coastal mountain region of Oregon. Though the primary audience for this report is EPA HQ's OPP and Region 10 staff, the report will be publicly available. For a copy of the narrative please contact Chad Schulze at (206) 553-0505. A copy of the full report with Attachments and Appendices is available through EPA's formal Freedom of Information Act (FOIA) process. For more information on the FOIA process or to make a request please visit;
<http://yosemite.epa.gov/r10/extaff.nsf/webpage/freedom+of+information+act?OpenDocument>. Fees may apply.

EPA Region 10 has already provided several briefings to recap the trip to interested parties such as ODA, ODF, timber companies and their associations, Day Owen, and EPA HQ's OPP. EPA used the PowerPoint Presentation in **Attachment 18** during the trip briefings. The presentation has been edited slightly and additional figures have been added to its original version.

Next Steps

Technical: Any decisions related to changing pesticide risk assessment processes and/or mitigation measures such as modifying application requirements though changes to pesticide product labeling are the responsibility of the EPA HQ's Office of Pesticide Programs.

Pitchfork Rebellion Petition: OPP is also responsible for assessing and responding to the petition and public comments received through the docket established for the petition.

The Region 10 Pesticide Program will continue to monitor and assess the issues identified in this report and seek opportunities to work with interested and affected parties in pursuit of productive and collaborative



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solutions. Individual complaints submitted directly to EPA related to specific pesticide applications in Oregon will be referred to ODA as the State Lead Agency with primary enforcement authority for investigating and acting on pesticide use violations. However, in keeping with standard practice and oversight responsibilities, EPA will enter the information into the Region 10 complaint tracking system and follow-up with ODA on their response. As the Pesticide Program does not have the expertise needed for proper evaluation, some of the information that has been provided to Region 10 related to claims of adverse health effects from pesticide exposures from forestry applications has been referred to the Seattle Office of the federal Agency for Toxics Substances and Disease Registry (ATSDR), which is part of the Center for Disease Control (CDC).

Attachment 19 contains field notes from Schulze and Halbert.



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LIST OF APPENDICES

Appendix A	An illustrated manual titled <i>Oregon's Forest Protection Laws</i>
Appendix B	The Forest Practice Administrative Rules and Forest Practices Act and 2008 Supplement
Appendix C	1997 Forest Practice Notes article titled <i>Chemicals and Other Petroleum Products</i>
Appendix D	July 6, 1995 Memorandum of Agreement between Oregon Department of Agriculture and the Oregon Board of Forestry
Appendix E	March 2000 ODF Final Report titled <i>Aerial Pesticide Application Monitoring</i>
Appendix F	April 2002 ODF Final Report titled <i>Best Management Practices Compliance Monitoring Project</i>
Appendix G	2009 American Society of Agricultural and Biological Engineers study titled <i>Deposition of Aerially Applied Spray to a Stream within a Vegetative Barrier</i>

LIST OF ATTACHMENTS

Attachment 1	ODF agenda for June 16, 2010, West Lane County Tour.
Attachment 2	ODF PowerPoint presentation on history of ODF and the FPA.
Attachment 3	Blank ODF Notification Form.
Attachment 4	Photo Log, CD, and thumbnails.
Attachment 5	Weyerhaeuser color topographic map indicating distances from their Units to concerned residences.
Attachment 6	ODF packet of information regarding a March 2009 Seneca aerial application to the Fish Creek Unit and subsequent citizen complaint.
Attachment 7	Package provided by Gary Hale containing ODOT records from roadside applications along Hwy 36, labels and Material Safety Data Sheets (MSDSs).
Attachment 8	Photographs referenced during the Virtual Tour presentation and a video of the meeting provided by Amy Pincus Merwin of Inform Media.
Attachment 9	Eron King's videos of aerial applications near Triangle Lake.
Attachment 10	Amy Pincus Merwin's May 13, 2010, email addressed to Scott Downey, requesting EPA consider conducting epidemiological studies in areas around the Siuslaw valley.
Attachment 11	Map showing distance from Kohlman's farm to the Tyee Resource unit and five other units: Valley Sandwich, Lost Bottle, Bottle Caps, Tyee Sandstorm, and 3 Mile Lost Forde.
Attachment 12	Videos and photographs of aerial applications near Kohlman's Vineyard.
Attachment 13	EWEB's PowerPoint Presentation on their Comprehensive Monitoring Project.
Attachment 14	LCOG's 2009 <i>Forest Spray Data Summary</i> summarizing ODF Notification information for the McKenzie River Watershed.
Attachment 15	Cedar Flats community Petition to Weyerhaeuser titled <i>Weyerhaeuser Herbicide Spraying at Cedar Flat Unit</i> .
Attachment 16	Weyerhaeuser June 30, 2010, Open House Invitation to Cedar Flats Community
Attachment 17	OTA letter to EPA regarding Pesticide Spray in Forestry Practices in Oregon
Attachment 18	PowerPoint presentation used for trip downloads
Attachment 19	Schulze and Halbert field notes

CDs Available upon Request

The 7 CDs from the original **June 16-18, 2010, Tour of Oregon Forestry and Pesticide Use Issues Trip Report** are not included in this copy of the trip report. Certain CDs are available upon request. Please contact Chad Schulze at (206) 553-0505 or Erin Halbert at (206) 553-4627 for more information on obtaining copies of the CDs.

List of CDs in Original Trip Report

Attachment 4: Tour of Oregon Forestry and Pesticide Use Issues Trip Photos

Attachment 8: Video of the Virtual Tour Meeting Presentations
Stuart Turner's Pictures shown during the Virtual Tour

Attachment 9: Eron King's Aerial Application Videos near Triangle Lake

Attachment 12: Aerial Application Video taken near Kohlman's Vineyard
Lone Rock Spray near Kohlman's Vineyard

Attachment 13: EWEB Presentation on Comprehensive Monitoring Project

A

Oregon's Forest Protection Laws: An Illustrated Manual

For copies, contact:

317 SW Sixth Avenue, Suite 400

Portland, OR 97204

Phone: (971)673-2944

(800) 719-9195

Fax: (971) 673-2946

Web: www.oregonforests.org

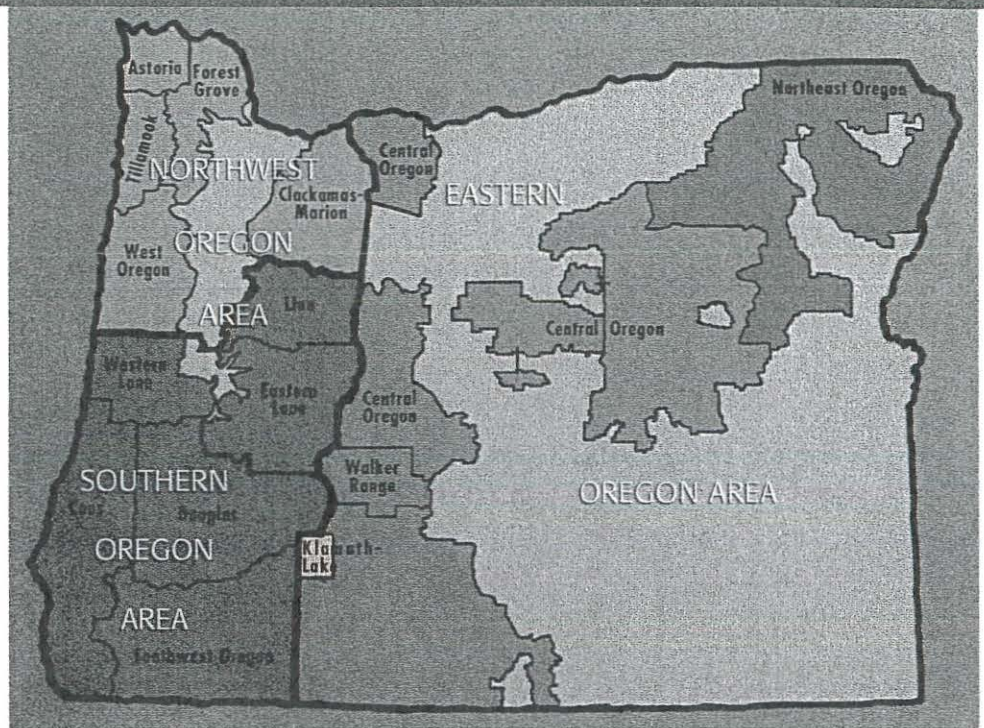
E-mail: info@ofri.com

Copies are also available through headquarters or local offices of the Oregon Department of Forestry (see page 9 for ODA contact information).

Forest Practices Act

<http://www.leg.state.or.us/ors/527.html>

Oregon is divided into three administrative areas. Each area has Forest Protection Districts. Know your local ODF district.



Local ODF offices

For more information about the Oregon Forest Practices Act or the forest practice rules, please contact your local ODF district office or the headquarters office at: 2600 State Street
Salem OR 97310
(503) 945-7470
www.odf.state.or.us/

This manual goes a long way toward explaining the requirements, but it may not be enough. The application of forest practices on specific sites can sometimes be complex. Always verify details with the ODF. Get a copy of the Act/Rules. Ask ODF your questions before starting.

EASTERN OREGON AREA

Central Oregon District	3501 E 3rd Street, Prineville, 97754	(541) 447-5658
John Day Unit	3501 E 3rd Street, Prineville, 97754	(541) 447-5658
The Dalles Unit	400 NW 9th Street, John Day, 97845	(541) 575-1139
Sisters Sub-Unit	3701 West 13th Street, The Dalles, 97058	(541) 296-4626
Fossil Sub-Unit	221 SW Washington, Sisters, 97759	(541) 549-2731
Klamath/Lake District	45945 Hwy 19, Fossil, 97830	(541) 763-2575
Lakeview Unit	3200 DeLap Road, Klamath Falls, 97601	(541) 883-5681
Northeast Oregon District	2290 North 4th Street, Lakeview, 97630	(541) 947-3311
Wallowa Unit	611 20th Street, La Grande, 97850	(541) 963-3168
Pendleton Unit	802 West Hwy 82, Wallowa, 97885	(541) 886-2881
Baker Sub-Unit	1055 Airport Road, Pendleton, 97801	(541) 276-3491
	2995 Hughes Lane, Baker City, 97814	(541) 963-7171

NORTHWEST OREGON AREA

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Tillamook District	92219 Hwy 202, Astoria, 97103	(503) 325-5451
Clackamas-Marion District	4907 East 3rd Street, Tillamook, 97141	(503) 842-2545
Santiam Unit	14995 S Hwy 211, Molalla, 97038	(503) 829-2216
Forest Grove District	22965 North Fork Rd., SE Lyons, 97358	(503) 859-2151
Columbia City Unit	801 Gales Creek Rd., Forest Grove, 97116	(503) 357-2191
West Oregon District	405 E Street, Columbia City, 97018	(503) 397-2636
Dallas Unit	24533 Alsea Hwy, Philomath, 97370	(541) 929-3266
Toledo Unit	825 Oak Villa Road, Dallas, 97338	(503) 623-8146
	763 NW Forestry Road, Toledo, 97391	(541) 336-2273

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Southwest Oregon District	4690 Hwy 20, Sweet Home, 97386	(541) 367-6108
Douglas District	5286 Table Rock Rd., Central Point, 97502	(541) 664-3328
Grants Pass Unit	1758 NE Airport Road, Roseburg, 97470	(541) 440-3412
Western Lane District	5375 Monument Drive, Grants Pass, 97526	(541) 474-3152
Florence Unit	87950 Territorial Hwy, Veneta, 97487	(541) 935-2283
	PO Box 460, Florence, 97439	(541) 997-8713

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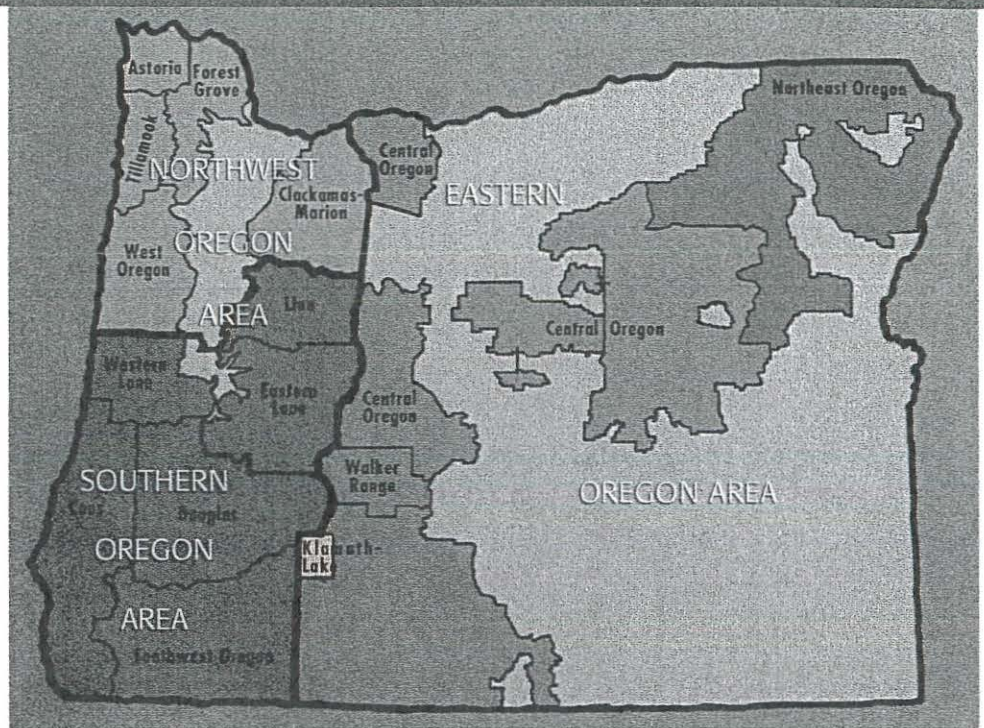
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	PO Box 460, Florence, 97439	(541) 997-8713

B

Oregon Department of Forestry
Forest Practices Administrative Rules and
Forest Practices Act
(ODF's "newsprint" version)

<http://www.oregon.gov/ODF/privateforests/docs/guidance/FPArulebk.pdf>

Addendum to July 2008
Forest Practices Administrative Rules and
Forest Practices Act

<http://www.oregon.gov/ODF/privateforests/docs/guidance/2008FPArulebkAddendum.pdf>

2008 Supplement to
Oregon's Forest Protection Laws – An Illustrated Manual

http://oregonforests.org/assets/uploads/OR_Forest_Protection_Illustrated_supp.pdf

2008 Supplement to Oregon's Forest Protection Laws – An Illustrated Manual

(October 2, 2008 revision)

This supplement highlights and describes important changes in the Oregon Forest Practices Act and Rules (FPAR) and their administration since the Illustrated Manual was published in 2002. From their inception in 1971-72, The FPAR have been updated frequently as our knowledge, experience and concerns about forest resources and operations have evolved.

This 2008 supplement begins with a brief summary of the significant FPAR changes since 2002, and follows with more thorough descriptions of these changes and how they compare with what the Manual says. Although this supplement was relatively current and comprehensive when printed, always check with the Oregon Department of Forestry (ODF) to be sure you have the latest and most detailed information to help you comply with the FPAR to protect Oregon's valuable forest resources.

Major changes that affect all or many plans for forest operations:

Stewardship Foresters of the ODF administer and enforce the requirements of the FPAR. These employees formerly were called Forest Practices Foresters (FPFs).

Prior approval from ODF is no longer needed for most operations that require a written plan, but the ODF may provide comments on the plan to help landowners and operators comply with the FPAR. Plans for an alternate practice continue to require written approval from ODF.

ODF comments on operations that require a written plan under Oregon Revised Statutes (ORS) are issued no sooner than 14 days, nor later than 21 days, after the plan is filed. Other operations that require a written plan under Oregon Administrative Rules (OAR) have a 14-day review period, which can be waived by ODF.

Civil penalties are a key deterrent in FPAR enforcement, with behavior modification to prevent resource damage as a primary focus in penalty administration.

Other important changes that may affect plans for forest operations in some specific situations:

Type F streams with an artificial barrier to upstream fish use are now classified as Type F beyond this point up to the first natural barrier to fish use. The Type F stream protection requirements also apply to such sections even if there is no current fish use or if a fish survey has not been conducted.

Large wood placement to improve stream habitat and increase allowable riparian timber harvest levels ("active management" option) should favor naturally stable wood (i.e., no artificial anchoring). Such wood placement also normally no longer requires a US Army Corps of Engineers permit if there is ODF oversight through a required written plan that meets specific guidelines.

Wet weather road use requires durable surfacing or other measures that will resist deep rutting or mud layers on road segments that drain directly to streams. Active road use must stop if runoff from such conditions visibly increases the turbidity of a Type F or D stream.

Operations in landslide-prone terrain are carefully screened to address concerns for public safety. Written plans and unique restrictions on timber harvest and road construction may be required where a significant public safety risk is identified.

Small, Type N streams prone to rapidly moving landslides require some wildlife trees and snags to be left within 50 feet of the stream, if over 25 acres of the area are clearcut. These are not additional leave trees but rather direct the specific location of some of the leave trees already required for wildlife and stream protection.

As with all laws, the details are important!

In many cases "What the manual says" remains generally accurate and useful, but some important details or areas of emphasis have changed, and are now "What you need to know."

Stewardship Foresters

What the manual says

Forest Practices Foresters, or FPFs, are mentioned throughout the manual, including several times in the initial section on "How to comply with the Oregon Forest Practices Act" (page 8). When the manual was printed, Forest Practices Forester was the title of the Oregon Department of Forestry (ODF) employees primarily responsible for direct administration and enforcement of the Forest Practices Act and Rules (FPAR).

What you need to know

Stewardship Forester (SF) is the updated title for ODF personnel who administer the FPAR. In addition to local FPAR administration, most SFs now provide private landowners with technical assistance for forest resource management. The title change thus reflects this broader work responsibility, plus the fact that the primary goal of the FPAR is good stewardship of forest resources.

Your local SF is your key ODF contact and information source for the FPAR as it relates to forest operations you are planning. However, keep in mind that your SF also can provide technical guidance and other help for managing forest resources, including identifying and applying for financial assistance (cost-sharing, tax credits, grants, etc.).

Written Plans, Approval, & Comments

What the manual says

Throughout the manual (i.e., six major sections) there are many statements highlighting the need for ODF "(prior) approval" of plans that involve some specific types of forest operations. These discussions cover many different activities and situations that, in most cases, require a written plan in addition to the basic "Notification of Operations."

What you need to know

The FPAR was not designed as a "permit" program, and previous requirements for agency "approval" raised substantial confusion and legal issues because permit programs often feature such approvals. The Oregon Legislature and the Board of Forestry addressed these problems by eliminating the formal approval requirements in the FPAR, although careful review of written plans continues.

Elimination of the approval process does not fundamentally change the need for you to carefully plan your forest operations, including filing a written plan when required to help protect important resources. To be considered complete, there are several types of specific information that must be included in all written plans, and some situations may require even more details.

For written plans required under Oregon Revised Statutes (e.g., forest operations within 100 feet of a Type F or D stream), the ODF must contact the filer about the plan within 14 to 21 days. Written plans required under Oregon Administrative Rules have a 14-day review period that can be waived by ODF. Feedback from ODF on written plans often includes specific comments that can help landowners and operators meet both the resource protection objectives and the legal responsibilities of the FPAR.

Note: Plans for an alternate practice continue to require written approval from ODF.

Penalties & Administration

What the manual says

The manual briefly states that civil and criminal penalties may result from violations of the FPAR. Several examples of FPAR violations also are mentioned elsewhere in the manual.

What you need to know

Although criminal penalties remain an option for the most serious offenses, civil penalties (e.g., fines of \$25 to \$5000 for each specific violation) are the primary means for discouraging violations of the FPAR. In addition, the ODF administers the civil penalty program with an emphasis on modifying behavior to prevent resource damage. Where a required protective practice is absent but corrective action still can be taken to prevent damage or otherwise address the problem, an SF may issue a written statement of unsatisfactory condition seeking damage prevention.

In some cases, measures for damage mitigation or resource enhancement may be substituted for all or part of a civil penalty assessment. If there is a disagreement about a citation or penalty, specific procedures ("Central Hearing Process") and other administrative steps are followed to clarify the facts and resolve the dispute.

Identifying & Protecting Type F Streams

What the manual says

Many of the FPAR requirements for stream protection vary with stream type, size, and geographic location. The manual specifically states that "Type F streams have fish."

What you need to know

ODF now classifies all streams as Type F up to the first natural barrier (usually a waterfall or steep chute) or to where no fish are found with a fish use survey. Some Type F streams have an artificial barrier (typically an older culvert installation that is not "fish friendly") that prevents upstream fish use. This formerly resulted in a Type N or D classification upstream beyond the barrier. Now, even without current fish use, the upstream section where fish would be if the barrier was absent is classified as Type F. In addition, where fish use surveys have not been conducted, and regardless of any artificial barriers, ODF now classifies all streams as Type F up to the first natural barrier. A landowner or operator also may request an agency fish use survey, or conduct their own using specific guidelines, in locations where fish surveys have not been conducted.

Standard FPAR protection requirements for Type F streams (e.g., retaining some riparian trees and other vegetation) apply to such reclassified sections above artificial barriers. When an older structure on a Type F stream is repaired or replaced, the FPAR require that the new installation allow for fish passage. Thus, stream sections above current barriers are likely to be repopulated with fish over time, and Type F stream protection measures applied now will help maintain or improve the habitat they will occupy eventually. Exceptions to such stream reclassification and protection requirements may be granted if the artificial barrier is expected to persist for a long time after current operations, preventing fish re-establishment.

Placing Wood in Streams

What the manual says

In exchange for stream improvement work (e.g., placing wood in the stream channel) described in a written plan, more timber can be harvested near Type F streams than is normally allowed.

What you need to know

The allowance for additional riparian timber harvest requires that the wood used for stream improvement meet acceptable length and diameter standards for the size and expected high flows of the stream. The placement guidelines favor relatively stable wood that can reconfigure with natural stream flows, rather than engineered and anchored structures.

Although not a FPAR change, an interagency agreement now exempts placement of large wood in forest streams from requiring a US Army Corps of Engineers permit. In most cases, such wood placement will require only ODF notification and written plans that meet ODF and Oregon Department of Fish and Wildlife (ODFW) standards outlined in "A Guide to Placing Large Wood in Streams" (May 1995). This permit exemption can make it easier to integrate wood placement work into active logging operations when the needed equipment and labor are readily available.

Using Roads in Wet Weather

What the manual says

A durable surface (quality rock, etc.) is needed for wet season road use to avoid serious rutting and muddy runoff that can impact water quality. In addition, in eastern Oregon snow plowing is needed to promote a hard, frozen road surface during winter use and effective drainage during spring melt.

What you need to know

Active road use must cease where there are deep ruts or mud that creates runoff from that road segment that causes a visible increase in the turbidity (i.e., muddiness) of nearby Type F or Type D streams. Durable surfacing or other effective measures are needed to avoid such conditions with roads used for log hauling during wet periods. For roads in eastern Oregon there are no further FPAR requirements beyond these directives, although ODF has developed some related guidance about road use and thawing periods.

Landslide-prone Terrain

What the manual says

A detailed section of the manual describes and illustrates locations and problems where rapidly moving landslides may occur on forest lands. Some specific requirements and restrictions for forest landowners and operators also are discussed.

What you need to know

Detailed rules and guidance apply to forest operations in areas prone to shallow, rapidly moving landslides. Of primary concern is public safety and thus a key step is ODF screening of operations that include high landslide hazard locations that may affect exposed populations. Such locations include steep (> 75 to 80 percent) slopes or steep (> 65 to 70 percent) headwalls, although field inspections may reveal hazardous areas with lesser slopes. With additional site-specific information (sometimes including a required geotechnical assessment), landslide impact ratings and public safety risk levels are identified by ODF.

Depending on the downslope public safety risk level, timber harvesting or road construction may be significantly restricted in high landslide hazard locations and along the likely depositional reaches of debris torrent-prone streams. For example, where there is an intermediate or substantial downslope safety risk, no harvest is allowed on upslope high hazard locations. Written plans are required for all timber harvesting or road construction operations with intermediate or substantial downslope safety risk, including a geotechnical report for some situations.

Another concern in areas of shallow, rapidly moving landslides is their role in adding desirable woody debris for fish habitat downstream. Some trees thus must be retained within 50 feet on both sides of the lower portion (i.e., 500 upstream of a Type F stream) of small Type N Streams subject to such landslides (as identified by ODF). This does not require landowners to leave more trees in harvest units but rather directs the streamside location of the 2 green trees and 2 snags per acre that already must be retained as wildlife trees in clearcut (and some overstory removal) areas over 25 acres.

*Updated ODF contact and other Information (changes highlighted in **bold**):*

Oregon Dept. of Forestry (state headquarters), 2600 State Street, Salem, 97310

Phone: **503-945-7200**; Fax: 503-945-7212; TTY: 800-437-4490

Web site: <http://egov.oregon.gov/ODF/>

E-mail: information@odf.state.or.us

Note: Recent changes in the ODF Forest Protection Districts and local offices have altered some of the map and contact information on page 9 of the Illustrated Manual.

Sisters Sub-Unit, **114 W Washington**, Sisters, 97759, (541) 549-2731

Baker Sub-Unit, 2995 Hughes Lane, Baker City, 97814, (541) **523-5831**

Tillamook District, **5005 3rd Street**, Tillamook, 97141, (503) 842-2545

Molalla Unit, 14995 S Highway 211, Molalla, 97038, (503) 829-2216

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ODF Forest Rules and Laws web page:

<http://egov.oregon.gov/ODF/lawsrules.shtml>

ODF Private Forests Resources (publications, etc.) web page:

[http://egov.oregon.gov/ODF/PRIVATE FORESTS/PCFPubIndex.shtml](http://egov.oregon.gov/ODF/PRIVATE_FORESTS/PCFPubIndex.shtml)

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FOREST PRACTICE NOTES

JANUARY 1997 • NUMBER 3
(Revised August 2007)



PUBLISHED BY
THE PRIVATE AND COMMUNITY
FORESTS PROGRAM
OREGON DEPARTMENT OF FORESTRY
2600 STATE STREET
SALEM, OR 97310

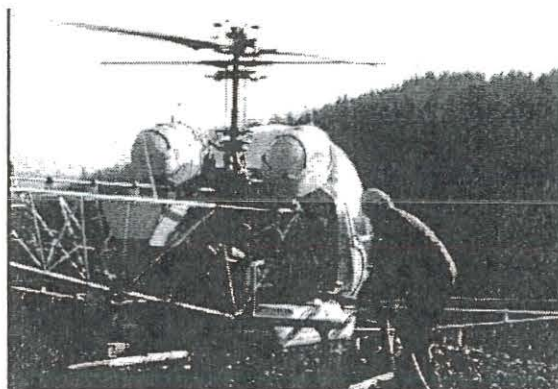
"STEWARDSHIP IN FORESTRY"

This *Forest Practices Note* explains the Oregon Board of Forestry's regulations for using pest control chemicals and other petroleum products on forestlands. The Oregon Department of Forestry administers these regulations under the authority of the Oregon Forest Practices Act.

In using chemicals and petroleum products, forest landowners and operators need to know about other agencies' rules, in addition to the forest practice rules. Forest operations using chemicals and petroleum products on forestland may also be subject to:

- The pesticide control laws administered by the Oregon Department of Agriculture
- The hazardous waste laws administered by the Oregon Department of Environmental Quality
- The hazard communication rules administered by the Oregon Occupational Safety and Health Division
- The water use laws administered by the Oregon Water Resources Department

For example, using water from streams, lakes, or other surface water bodies to mix pest control chemicals requires prior notice to the Oregon Water Resources Department and the Oregon Department of Fish and Wildlife. Notifying the Department of Forestry of the planned operation does not satisfy this requirement. The forest operator must send copies of the original notification to the other agencies' local offices at least 15 days before beginning the operation.



CHEMICALS AND OTHER PETROLEUM PRODUCTS

Questions answered in this Forest Practices Note...

What types of "chemicals" and "other petroleum products" are subject to the forest practice rules?	2
What is the purpose of the forest practice rules regulating the use of chemicals and other petroleum products?.....	2
What is required in a Written Plan?.....	2
What additional information is required on a notification of operation when a forest operation involves a chemical application?	3
What actions must be taken to prevent, control, and report leaks and spills of chemicals and other petroleum products?	3
What special precautions must be taken to protect water quality when mixing chemicals on forestland?..	3
What actions must be taken to protect water quality when locating mixing, transfer, and staging areas for chemicals and other petroleum products?.....	4
When chemicals are applied on forestlands, how will water quality and other resources be protected?.....	5
What information must be recorded and maintained on forest chemical application?	5
..... See the <i>Daily Application Record Form</i> on page 7.	
What special actions must be taken when applying chemicals near streams used by community water systems?.....	5
Where can information on chemicals used on forestland be obtained?	6
How can citizens learn about forest chemical operations in their local area?	6

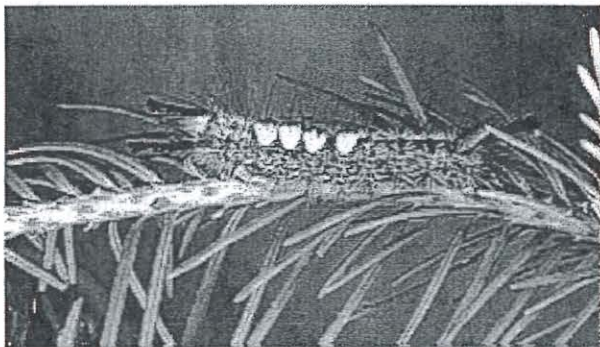
What types of "chemicals" and "other petroleum products" are subject to the forest practice rules?

In the rules, the term "chemicals" refers to all classes of pesticides and more, including:

- Herbicides
- Insecticides
- Rodenticides
- Fungicides
- Petroleum products used as carriers for pesticides
- Additives called adjuvants used in pesticide solutions, such as surfactants, drift control additives, anti-foam agents, wetting agents, and spreading agents
- Fertilizers

"Other petroleum products" that may be present on any forest operation and subject to the forest practice rules include engine fuels, hydraulic fluid, lubricating oils, and greases.

The forest practice rules distinguish between "chemicals" and "other petroleum products" and only certain rules apply to the "other petroleum products."



What is the purpose of the forest practice rules regulating the use of chemicals and other petroleum products?

The Board of Forestry encourages voluntary use of integrated pest management. This is a process that reduces the effects of forest pests (including vegetation competing with young trees) in an environmentally and economically sound manner to meet the landowner's site-specific objectives. Using pesticides is one of a variety of integrated pest management strategies forest landowners may use. When properly used, pesticides and other chemicals can be effective tools in freeing forest trees from damaging competitive vegetation, insects, and diseases.

What is required in a Written Plan?

A written plan must be submitted for any chemical operation located within 100 feet of a type F or D stream, or within 300 feet of a specified resource site. Written plans must be clear, concise, and capable of standing alone as complete documents.

Three basic elements are essential to such plans:

1. An adequate description of the planned operation
2. An adequate description of the protected resources
3. A description of how the resources will be protected during the operation

The operation's specific conditions will determine the information needed to fulfill these elements of the written plan.

Some information items are needed in every written plan, while some are not. The following list is a good reference. For more detail, contact your local department office for assistance.

Items for every chemical application written plan:

- Names of the operator and landowner
- Legal description or clear association with a particular notification and unit number
- A complete map showing the operation, the protected resources, section lines, access roads, etc.
- The common name(s) and, if known, the product brand name(s) of the chemical(s) to be used
- The type of application method (aerial/ground, pressurized backpack/hack and squirt, etc.)
- The type of vegetation to be controlled
- An adequate description of the protected resource (stream type & size, nesting site, etc.)
- A description of the resource site's associated components (alternate nest trees, perch trees, etc.)
- The measures that will be taken to protect the resource site during the operation (using a single boom system to minimize drift, using a target-specific chemical, using the wind to carry drift in a safe direction, etc.)
- The signatures of the operator and/or landowner

Additional items which may be required in the written plan:

- The heliport location
- The chemical mixing location
- Plans for meeting any unique requirements on the product label
- Plans for finding and marking the locations of streams prior to spraying

The purpose of the forest practice chemical and other petroleum product rules is to establish requirements that will ensure:

1. Chemicals and other petroleum products used on forestland do not occur in the soil, air, or waters of the state in quantities that would be injurious to water quality or to the overall maintenance of terrestrial wildlife or aquatic life; and
2. Vegetation near the waters of the state and other sensitive resource sites receives protection on herbicide operations consistent with the requirements of other forest practice rules dealing with the protection of these important forest resources.

What additional information is required on a notification of operation when a forest operation involves a chemical application?

A notification must be submitted to the Department of Forestry at least 15 days before conducting a chemical application or other operation on forestland. When chemicals will be used, notifications must include:

- a) the common name of the chemical(s) to be used
- b) the product brand name, if known at the time of notification
- c) the application method
- d) for fertilizers, the intended application rate per acre



What actions must be taken to prevent, control, and report leaks and spills of chemicals and other petroleum products?

Operators must maintain chemical handling equipment in a leakproof condition. Operators include landowners, loggers, and pesticide applicators. The equipment may include whatever is

used for transportation, on-site storage, or application of chemicals. If there is evidence of chemical leakage, the equipment must not be used any more until it is repaired. Operators must also take adequate precautions to prevent leaks or spills of chemicals and other petroleum products from entering streams, ponds, lakes, wetlands or other waters.

When a spill or leak does occur, operators must immediately stop the leak and contain the spread of the spill. If the spill enters, or may enter streams, lakes, wetlands, or other waters of the state, operators must also immediately report it to the nearest Department of Forestry office. Reporting to the department will not exempt the operator from any requirements of other local, state, and federal agencies to report chemical or other petroleum product spills.

Persons responsible for spills of reportable quantities of chemicals or petroleum products must contact the Oregon Emergency Response System (OERS) at 1-800-452-0311 (503-378-6377 if near Salem). OERS serves as a central contact to notify state agencies of spills.

What special precautions must be taken to protect water quality when mixing chemicals on forestland?

Whenever water is taken from any stream or water impoundment for use in mixing chemicals, the operator must prevent chemicals from entering the water by taking at least the following precautions:

- Providing an air gap or reservoir between the water source and the mixing tank; and
- Using pumps, suction hoses, feed hoses, and check valves that are used only for water, never carrying chemical mix.

What actions must be taken to protect water quality when locating mixing, transfer, and staging areas for chemicals and other petroleum products?

When forest operations involve:

- Mixing chemicals;
- Transferring chemicals or other petroleum products between equipment or containers;
- Cleaning tanks or equipment used during chemical applications; or
- Landing and staging aircraft.

operators must conduct those activities only in locations where the site does not provide a route for any chemical or petroleum spill to run off into streams, lakes, wetlands, or other water bodies. The

minimum precaution is to avoid locating chemical mixing and staging areas within 100 feet of fish bearing streams or streams from which water is withdrawn for domestic use.

Table 1 summarizes the buffer requirements for different types of water bodies when chemicals are applied on forestland under the forest practice rules.

Chemical Application Buffers Required for the Water of the State by the Chemical and Other Petroleum Product Rules (<u>Also see notes below table</u>)	Herbicides, Rodenticides, Biological Insecticides, and All Other Chemicals Except Fungicides, Non-Biological Insecticides, and Fertilizers		Fungicides and Non-Biological Insecticides		Fertilizers	
	Aerial Applications	Ground Applications	Aerial Applications	Ground Applications	Aerial Applications	Ground Applications
Aquatic Areas of Fish Bearing Streams with no Domestic Use (Most Type F streams)	60 feet	10 feet	300 feet	10 feet	No direct application	No direct application
Aquatic Areas of Domestic Use Streams (All Type D and some Type F streams)	60 feet	10 feet	300 feet	10 feet	100 feet	100 feet
Aquatic Areas of Other Streams (Type N streams)	No buffer specified	No buffer specified	60 feet if flowing at time of application	No buffer specified	No direct application to large and medium streams	No direct application to large and medium streams
Significant Wetlands	60 feet	10 feet	300 feet	10 feet	No direct application	No direct application
Aquatic Areas of Lakes larger than 8 acres	60 feet	10 feet	300 feet	10 feet	No direct application	No direct application
Aquatic Areas of Other lakes with fish use	60 feet	10 feet	300 feet	10 feet	No direct application	No direct application
Other standing water larger than 1/4-acre at the time of application	60 feet	10 feet	300 feet	10 feet	No direct application	No direct application
All other waters	No buffer specified	No buffer specified	No buffer specified	No buffer specified	No buffer specified	No buffer specified

Notes for Table 1:

- All distances listed are measured horizontally.
- Direct application of chemicals is not allowed within the listed distances.
- In all cases when pesticides are used, applicators must also comply with all requirements of the label for the applied product. **Label requirements may require wider buffers than specified in the chemical and other petroleum product rules.**
- For herbicide applications, applicators must protect the vegetation required to be retained near the waters of the state by the general forest practice water protection rules. **These other rules may require wider buffers than specified in the chemical and other petroleum product rules and apply to all types of forest operations.**
- In certain situations, the Department of Forestry may approve plans for alternate practices that involve reducing the widths of buffers for aerial fungicides and non-biological insecticide applications.

When chemicals are applied on forestlands, how must water quality and other resources be protected?

Each forest pesticide has a federally approved label which describes how it must be applied. The label is a legal document and failing to follow the label requirements is a violation of both federal and state law.

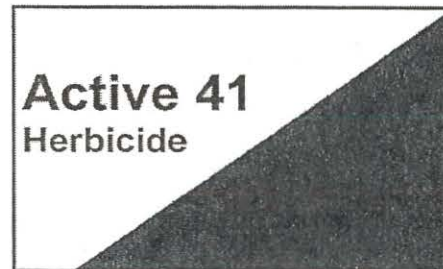
In addition, the forest practice rules require the following further actions by operators, because of the unique blend of resource issues, rugged terrain, and operational constraints that exist on forestland. These actions are related to weather conditions, aerial application parallel to streams, and buffering water bodies (see Table 1 on page 4).

Weather conditions such as temperature, relative humidity, wind speed, wind direction, atmospheric temperature inversions, and precipitation may strongly affect the deposition and drift of chemicals, especially during aerial and pressurized, ground-based chemical applications. Pesticide product labels may include specific requirements for weather conditions during applications. The forest practice rules do not contain weather limitations, but do require the weather during the application to be closely monitored and evaluated to ensure chemicals do not drift outside the target area.

Aerial chemical applications must be made parallel to the edges of streams and other waters to reduce the potential for chemicals to enter the water.

Specimen Label

CorzineTuff Company



Broad spectrum herbicide for use on cropland and in forestry site preparation.

What information must be recorded and maintained on forest chemical applications?

Table 2 lists the information that operators must collect and retain on file for three years after a forest chemical application. This information must be made available to the Department of Forestry upon request.

Table 2

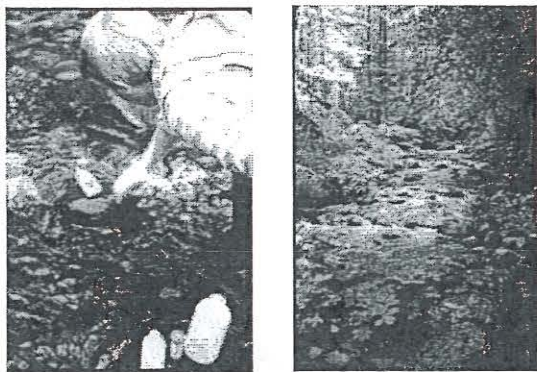
	Aerial pesticide applications and pressurized, ground-based broadcast pesticide applications with potential for drift, such as right-of-way and backpack sprayer applications	Other ground-based pesticide applications (stem injection, "hack and squirt", granular, etc.)	Fertilizer
Legal description	✓	✓	✓
Acres treated	✓	✓	✓
Chemical brand name or EPA registration number & application rate	✓	✓	
Date and time of application	✓	✓	✓
Air temperature	✓		
Relative humidity	✓		
Wind speed and direction	✓		
Applicator's name	✓	✓	✓

Note: Air temperature, relative humidity, wind speed and wind direction must be measured at least hourly for aerial applications and at least at the beginning and ending of each day's work for ground-based applications.

A standardized form is offered on page 7 of this note as one method of keeping the required records.

What special actions must be taken when applying chemicals near streams used by community water systems?

It is important that community water system managers are informed about planned chemical operations so they can coordinate their water quality monitoring activities with such operations. These requirements apply when chemicals will be aerially applied within 100 feet, or applied from the ground within 50 feet of domestic



use portions of Type F or Type D streams used by a community water system. The operator must notify the water system manager about the planned chemical operation at least 15 days before the operation begins. Notifying the Department of Forestry does not satisfy this requirement. This requirement generally only applies to community watersheds 100 square miles (64,000 acres) in size or smaller. Department field offices have a list of water systems requiring notification. This list is periodically updated.

If requested by the community water system manager, the operator must provide the following additional information before commencing the operation:

- The application technology that will be used
- Practices that will be followed to minimize drift toward the stream
- Any monitoring efforts that will be conducted by the landowner
- The planned time schedule for the application

Where can information on chemicals used on forestland be obtained?

Technical information on individual pesticides is available from a variety of sources, including the following:

- The Forest Chemical page at <http://egov.oregon.gov/ODF/> (look under "chemical use"). Concerned individuals or groups may use this site to view specimen pesticide and additive labels for allowable application rates and other information. The labels may also be useful for operators, but **applicators must always follow the instructions on the label that comes with the pesticide product.** Forest pesticide fact sheets are also available at this site.

- The National Pesticide Information Center (NPIC) at 1-800-858-7378, or <http://npic.orst.edu/>.
- The Extension Toxicology Network (EXTOXNET) at <http://extoxnet.orst.edu/>.

To learn about the potential human health effects of pesticide exposures and what to do if someone may have been exposed to pesticides, contact:

The Oregon Pesticide Analytical
and Response Center
at (503) 986-6470
or
Oregon Poison Center
at 1-800-222-1222

How can citizens learn about forest chemical operations in their local area?

Persons living in and near managed forestlands are encouraged to communicate directly with their neighboring forest landowners. Most industrial and non-industrial forest landowners are willing to explain the management plans for their property and listen to public comments and concerns.

Citizens may also receive information about forest operations, including chemical applications, by annually subscribing to copies of notifications of operations received by the Department of Forestry. Subscriptions apply to a geographic area of interest, and there is a fee to cover the cost of this service. Persons with a surface water right may request to receive copies of forest chemical application notifications within ten miles upstream of their property at no cost. Such requests must be made in writing to the department. A mandatory 15-day waiting period for all aerial chemical applications, and some ground-based applications, on forestlands allows interested parties the opportunity to comment to the Department of Forestry and to the operator about the planned activity.

For more information about the Oregon Forest Practices Act or the forest practice rules, please contact one of the Oregon Department of Forestry offices shown on the back page of this publication.



Daily Chemical Application Record Form

ODF ODA USDA This form outlines daily pesticide application information an applicator must record to meet requirements of the Oregon Departments of Forestry (ODF)¹ and Agriculture (ODA),² and the U.S. Department of Agriculture (USDA)³. An applicator may use a different form if the required information is included. *The applicator must retain the ODA and ODF-required records for 3 years, and the USDA-required records for 2 years.*

Landowner and Location

✓ Name, address, and telephone of person or business who owns or controls the property:

✓ ✓ ✓ Legal Description of Application Area:

Applicator

✓ ✓ ✓ Applicator (Name of Person Applying Chemical):

✓ Applicator Certification Number:

✓ Applicator Contractor:

Application Information

✓ Supplier of Chemical Product:

✓ ✓ ✓ EPA Registration Number and Product Brand Name:

✓ ✓ ✓ Number of Acres Treated:

✓ ✓ Per Acre Application Rate:

✓ Total Amount of Pesticide Product Applied:

✓ Carrier Used, including Rate/Acre:

✓ Application Equipment Used (Aerial, Backpack, Etc.):

If Aerial F.A.A. Aircraft Number:

✓ ✓ Crop (enter "forest" for forestry applications):

✓ ✓ ✓ Date of Application:

Beginning Time:

Ending Time:

ODF Only: Weather Information (For Aerial Applications Measure and Record Information Hourly; For Ground-Based Pressurized Broadcast Application Measure and Record Information at the Beginning and End of Each Day's Application):

Time:										
Air Temperature										
Relative Humidity										
Wind Speed										
Direction wind coming from (e.g., N or NNW)										

Applicator Signature:

¹ Oregon Department of Forestry requirements for all pesticide applicators

² Oregon Department of Agriculture requirements for commercial and public applicators. Applicators must also report to the Pesticide Use Reporting System at http://oregon.gov/ODA/PEST/purs_index.shtml.

³ U.S. Department of Agriculture requirements for private pesticide applicators using restricted use products.

ODF Field Offices Directory

Northwest Oregon Area

Astoria District
92219 Hwy 202
Astoria, OR 97103
(503) 325-5451

Forest Grove District/Forest Grove Unit
801 Gales Cr. Rd
Forest Grove, OR 97116
(503) 357-2191

Columbia City Unit
405 E Street
Columbia City, OR 97018
(503) 397-2636

North Cascade District/Santiam Unit
22965 North Fork Rd SE
Lyons, OR 97358
(503) 859-2151

Molalla Unit
14995 S. Hwy 211
Molalla, OR 97038
(503) 829-2216

Tillamook District
5005 East 3rd
Tillamook, OR 97141
(503) 842-2545

West Oregon District/W. Oregon Unit
24533 Alsea Hwy
Philomath, OR 97370
(541) 929-3266

Dallas Unit
825 Oak Villa Rd
Dallas, OR 97338
(503) 623-8146

Toledo Unit
763 NW Forestry Rd
Toledo, OR 97391
(541) 336-2273

Southern Oregon Area

Coos District
63612 Fifth Road
Coos Bay, OR 97420
(541) 267-3161

Douglas District
1758 NE Airport Road
Roseburg, OR 97470
(541) 440-3412

South Cascades District/
East Lane Unit
3150 Main Street
Springfield, OR 97478
(541) 726-3588

Sweet Home Unit
4690 Hwy 20
Sweet Home, OR 97386
(541) 367-6108

Western Lane District
P.O. Box 157
Veneta, OR 97487
(541) 935-2283

Southwest Oregon District/
Medford Unit (Central Point)
5286 Table Rock Rd
Central Point, OR 97502
(541) 664-3328

Grants Pass Unit
5375 Monument Drive
Grants Pass, OR 97526
(541) 474-3152

Eastern Oregon Area

Central Oregon District/ Prineville Unit
3501 E. 3rd Street
Prineville, OR 97754
(541) 447-5658

The Dalles Unit
3701 W. 13th St
The Dalles, OR 97058
(541) 296-4626

John Day Unit
P.O. Box 546
John Day, OR 97845
(541) 575-1139

Klamath-Lake District/
Klamath Falls Unit
3200 DeLap Road
Klamath Falls, OR 97601
(541) 883-5681

Lake Unit
2290 North 4th Street
Lakeview, OR 97630
(541) 947-3311

Northeast Oregon District/
La Grande Unit
611 20th Street
La Grande, OR 97850
(541) 963-3168

Pendleton Unit
1055 Airport Road
Pendleton, OR 97801
(541) 276-3491

Wallowa Unit
802 W. Hwy 82
Wallowa, OR 97885
(541) 886-2881

ODF on the Internet

Current Oregon forest practice rule information is available on the Internet at:

<http://egov.oregon.gov/ODF>
(click on "Private Forests")



"STEWARDSHIP IN FORESTRY"

OREGON DEPARTMENT OF FORESTRY
PRIVATE AND COMMUNITY FORESTS PROGRAM
2600 STATE STREET
SALEM, OR 97310

D

MEMORANDUM OF AGREEMENT
Between
The Oregon Department of Agriculture
And
The Oregon Board of Forestry

July 6, 1995

This Memorandum of Agreement is entered into between the Oregon Department of Agriculture, hereinafter referred to as "Agriculture," and the Oregon Board of Forestry, hereinafter referred to as "Forestry," to delineate the responsibilities and activities to be performed by each agency in regulating the use of pesticides on forestlands in Oregon. For this agreement, pesticides means any substance or mixture of substances meeting the definition provided in ORS 634.006 (8).

For the purposes of this agreement, "forestland" subject to the Oregon Forest Practices Act means land which is used for the growing and harvesting of forest tree species, regardless of how the land is zoned or taxed or how any state or local statutes, ordinances, rules or regulations are applied. In this context, forestland does not include land dedicated for tree nurseries or seed orchards. "Forest tree species", as defined by ORS 527.620 (7), do not include cultured Christmas trees or intensively managed, short-rotation hardwood plantations.

Preamble

The Oregon Legislature has authorized Agriculture to regulate the registration, distribution, and use of pesticides in Oregon. This authority is contained in Oregon Revised Statutes (ORS) Chapter 634, known as the "Oregon Pesticide Control Act" and dates back to 1953. Since 1976, Agriculture has annually entered into cooperative agreement with the United States Environmental Protection Agency (EPA) Region 10 regarding the enforcement of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) in Oregon.

The Oregon Legislature has authorized Forestry to establish standards for forest practices in Oregon to encourage economically efficient forest practices that assure the continuous growing and harvesting of forest tree species and the maintenance of forestland for such purposes as the leading use on privately owned land, consistent with sound management of soil, air, water, fish and wildlife resources and scenic resources within visually sensitive corridors. This authority is contained in ORS 527.610 to 527.992, known as the "Oregon Forest Practices Act" and dates back to 1971. Forestry is specifically directed by statute reference to consult with Agriculture before adopting rules on pesticide control [ORS 527.710 (4)(k)].

Memorandum of Agreement, July 6, 1995

Both Agriculture and Forestry have adopted administrative rules to carry out the purposes and intents of their respective authorizing statutes. The Forestry rules are administered and enforced by the State Forester.

Agriculture and the State Forester are members of, and active cooperators in, the Oregon Pesticide Analytical and Response Center (PARC). PARC coordinates and reports on state interagency investigations of actual or alleged health and environmental incidents involving pesticides in Oregon.

Mutual Agreements

A. The Roles of Agriculture and Forestry

1. In Oregon, Agriculture has entered into cooperative agreements with EPA regarding investigation, enforcement, applicator certification, groundwater protection, and worker protection under FIFRA. Through these agreements, EPA has recognized Agriculture as the state lead agency for the regulation of pesticides in Oregon. Also through these agreements, EPA has authorized primacy to Agriculture for enforcement of FIFRA in Oregon.

The Oregon Pesticide Control Act, and resulting administrative rules, provide the mechanism through which Agriculture carries out its responsibilities to enforce FIFRA. The Oregon Pesticide Control Act can be, and in many instances is, more strict in the regulation of pesticides than is FIFRA.

In addition to the process for registration of pesticides by EPA, the Oregon Pesticide Control Act requires: (1) registration of pesticides, (2) education and licensing of certain pesticide users (including commercial pesticide applicators, operators, and dealers), (3) record-keeping, and (4) application of pesticides in accordance with product labeling. Agriculture has authority to conduct investigations, and take enforcement actions, including imposition of civil penalties, when a violation has been documented.

Agriculture will continue to exercise its statutory authority and responsibility as the lead agency for licensing pesticide users and for regulating the registration, distribution, and use of pesticides in Oregon, including forestlands.

Memorandum of Agreement, July 6, 1995

2. Forestry's pesticide regulatory authority is limited to prescribing best management practices to ensure protection of soil, air, water, fish, and wildlife resources when pesticides are used on forestlands. The purpose of the chemical rules is to ensure that chemicals used on forestland do not occur in the soil, air, or waters of the state in quantities that would be injurious to wildlife, aquatic life, or to water quality, and to ensure that the vegetative components of riparian management areas and resource sites receive protection on chemical operations consistent with the protection expected on harvest operations.

The forest practice chemical rules must not be inconsistent, while minimizing duplication, with the requirements of :

- FIFRA administered by EPA;
- Oregon's pesticide control laws administered by Agriculture;
- Oregon's hazardous waste laws administered by the Department of Environmental Quality;
- Oregon's hazard communication rules administered by the Occupational Safety and Health Division; and
- The Federal Safe Drinking Water Act administered by the Oregon Health Division.

Forestry will exercise its statutory authority and responsibility to establish standards to be administered by the State Forester for the application of pesticides on Oregon forestlands. Forestry will also consider and accommodate the rules and programs of Agriculture to the extent deemed by Forestry to be appropriate and consistent with the Oregon Forest Practices Act and with Forestry's stated goal of ensuring that regulation of pesticides on forestlands is consistent with pesticide regulation on other land uses in Oregon.

B. Implementation Program

1. Pesticide Product Label Requirements Interpretation

Agriculture shall have sole state agency authority for interpreting pesticide product label requirements.

When the State Forester becomes aware of disagreements or uncertainties involving the interpretation of label requirements for forestry pesticides, the State Forester shall inform Agriculture and request clarification. Agriculture will respond with label interpretation.

Memorandum of Agreement, July 6, 1995

When the State Forester becomes aware of practices that are potentially inconsistent with the requirements on the applicable product label, the State Forester shall inform the affected parties, gather information on such practices, and inform Agriculture. Agriculture may conduct an additional investigation and will determine if an enforcement action, under the authority of its statutes and rules, is appropriate.

EPA shall have final authority for approving any changes in pesticide product labels.

When the State Forester becomes aware of the potential need for changes in a product label to better protect forest resources, the State Forester shall inform Agriculture. Agriculture will determine if recommendations to EPA for pesticide product label modifications are necessary.

2. Administrative Rule Development

Forestry and Agriculture will coordinate in the development of any administrative rules that address the application of pesticides on forestlands.

The State Forester and Agriculture will cooperate to ensure that any rules proposed for Forestry adoption (OAR Chapter 629) and any resulting rule guidance are consistent with Agriculture's rules and statutes. Agriculture will inform the State Forester when changes are proposed to OAR Chapter 603, the Oregon Pesticide Control Act, or FIFRA that could affect the application of pesticides or other chemicals on forestlands. When such changes are finalized by Agriculture, Forestry will revise the forest practice chemical rules as needed to maintain consistency with these other laws, while still meeting the intent of the Forest Practices Act.

3. Inspections.

Forest practices foresters (FPFs), under the direction of the State Forester, will act as the primary state inspectors of forest operations involving the application of pesticides. FPFs will be directed to communicate with Agriculture and to assist in Agriculture's investigation when product label compliance questions arise on forest operations. FPFs and Agriculture investigators will investigate pesticide-related field situations in the most efficient manner possible. Investigation information will be shared among FPFs and Agriculture investigators.

4. Field Sampling and Sample Analysis

Agriculture and the State Forester will cooperate in the collection of water, soil, foliage, tissue, or other types of samples that may be needed to administer and enforce Agriculture's and Forestry's rules.

When one agency requests the other agency to collect a sample, the agency receiving the request will cooperate to the extent that available resources and other workloads will allow. In such cooperation, the agencies will agree to the sample collection, storage, and documentation protocols to be used. The cost of analyzing the sample will be borne by the requesting agency.

5. Citations and Civil Penalties

Citations will be issued by the State Forester when violations of the forest practice rules or the Forest Practices Act are detected. Citations will be issued by Agriculture when violations of the Oregon Pesticide Control Act are determined by Agriculture. Information regarding violation determinations, enforcement actions, civil penalty procedures, contested case hearings, penalty collection processes, and historical violation records will be shared between the two agencies.

The State Forester and Agriculture may coordinate in taking enforcement actions for activities which violate both the Oregon Pesticide Control Act and the Oregon Forest Practices Act. Enforcement action taken by one agency will not preclude the taking of enforcement action by the other agency. Both agencies may issue citations for pesticide product label violations. However, imposition of civil penalties for pesticide product label violations will generally be deferred by the State Forester to Agriculture.

6. Training

Agriculture and Forestry will cooperate to encourage forest landowners and licensed operators who apply forest pesticides to receive ongoing training on current forest pesticide products and the special conditions affecting forest pesticide applications.

Memorandum of Agreement, July 6, 1995

C. Coordination

Agriculture and Forestry mutually agree to designate the Assistant Director of the Oregon Department of Agriculture and the Director of the Oregon Department of Forestry's Forest Practices Program as contact persons to coordinate the execution of this Memorandum of Agreement.

D. Administration

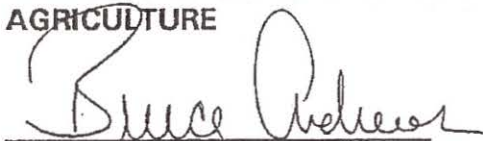
This Memorandum of Agreement will remain in effect unless it is replaced by another Memorandum of Agreement, or it is terminated either by mutual consent of the parties, or by thirty days' notice of cancellation from one party to the other party. Such termination shall be in writing.

Agriculture and the State Forester will review this Memorandum of Agreement through regularly scheduled annual coordination meetings. Any recommendations for modifying this Memorandum of Agreement will be forwarded to the Board of Forestry for consideration.

E. Expenditure of Funds

Nothing in this Memorandum of Agreement shall be construed as obligating Agriculture, Forestry, or the State Forester to expend funds or involve either party in any contract or other obligation for the future payment of money in excess of appropriations authorized by law and administratively available for this work.

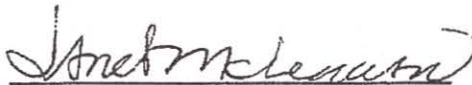
OREGON DEPARTMENT OF
AGRICULTURE



Director

Date: 8-29-95

OREGON BOARD OF FORESTRY



Chair

Date: 7/21/95

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Oregon Department of Forestry: Aerial Pesticide Application Monitoring Final Report

Liz Dent
Monitoring Unit Manager

Joshua Robben
Monitoring Specialist



**OREGON DEPARTMENT OF FORESTRY
FOREST PRACTICES MONITORING PROGRAM
TECHNICAL REPORT 7
March 2000**



Acknowledgements

The assistance and cooperation of private landowners, pesticide applicators, representatives of the environmental community, Oregon State University (OSU), Oregon Department of Forestry (ODF) field staff, the Oregon Department of Agriculture (ODA) laboratory, and community water managers were instrumental in designing and implementing this project.

The Chemical Rules Subcommittee (listed after the table of contents), Paul Bell, and Jenny Walsh were all instrumental in the study design and implementation of this project. Kyle Abraham, Erin Gilbert, Amber Kubischta, Yvette Frazier, Kevin Tuers, Dave Ryland, Mike Kroon, Laura Ramme, and Jenny Walsh were all responsible for data collection. Ray Gress, Peg Foster, and Jan Pugh provided valuable project support. Charlie Stone, Ted Lorensen, and David Morman prioritized this project for the monitoring program. This project would not have been possible without the participation of private landowners and operators including Boise Cascade, Cascade Timber Co., Evenson Timberland Agency, Longview Fibre, Menasha Timber, Roseburg Forest Products, Simpson Timber, Starker Forests, Western Helicopter, Shannon White, and Willamette Industries. Thanks to Dave Pederson and the ODA lab for their expertise and timely analysis of the samples. The authors would also like to thank all the forest practice foresters and ODF State Lands personnel who made the site selection process possible, contacted landowners, and arranged logistics to support the field teams.

Table of Contents

Chemical Rules Subcommittee	i
Introduction.....	1
Rules and Regulations.....	1
Forest Practices Monitoring Program.....	2
Past Findings With Regard to Aerial Application of Pesticides.....	2
Water Sampling Results	2
Peak Concentrations Generated By Precipitation	3
Study Design	4
Monitoring Questions	4
Water Quality Sampling Design.....	4
Riparian Vegetation Protection.....	6
Site and Operation Characteristics	6
Evaluation Methods	12
Protection of Water Quality	12
Protection of Riparian Vegetation.....	12
Results.....	12
Protection of Water Quality from Drift Contamination.....	12
Operation Characteristics for Sites with Drift Contamination.....	13
Protection of Water Quality from Runoff Contamination	13
Protection of Riparian Vegetation.....	13
Summary and Conclusions	18
Recommendations.....	19
References.....	21
Appendix A: Pesticide Label Information, and Field Forms	A-1
Appendix B: Pesticide Application Operational Data	B-1
Appendix C: Site Maps	C-1

Tables:

Table 1. Site Characteristics.....	8
Table 2. Weather Conditions and Operations Characteristics.....	9
Table 3. Target Pest, Chemicals Applied and Rate Information	10
Table 4. Surface Water Quality Criteria for Forest Chemicals.....	11
Table 5. Water Sample Pesticide Analysis Results	14
Table 6. Impacts to Riparian Vegetation from Aerial Herbicide Applications.....	17

Figures:

Figure 1. Pesticide Monitoring Results From Three Studies in Washington and Oregon	3
Figure 2. Water Quality Monitoring Operation Locations.....	7
Figure 3. Concentrations of Pesticides Detected in 129 Post-Spray Samples from 26 operations ...	15
Figure 4. Pesticide Concentration Levels Detected in Water Samples from Sites 22 and 25.....	16

**Chemical Rules Subcommittee
Monitoring Protocol Development Team Members**

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Dr. Nancy Kerkvliet	Oregon State University
Bob Noelle	Medford Water Commission
Dr. George Ice	National Council for Air and Stream Improvement
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Dennis Ades	Oregon Department of Environmental Quality
Dick Miller	Taxon Aquatic Monitoring Company
Mark Gourley	Starker Forests
Norma Grier	National Coalition for Alternatives to Pesticides
Alan Brog	Oregon Department of Forestry
Dr. Arne Skaugset	Oregon State University

ODF Aerial Pesticide Application Monitoring Project

Final Report

January 2000

Introduction

Forest pesticides, which include herbicides, fungicides, insecticides, and rodenticides, are commonly used to aid in the re-establishment, growth, and survival of forest tree species throughout Oregon. In 1997 the Oregon Board of Forestry revised forest practice rules governing application of pesticides and other chemicals (OAR 629-620). The rule revision process committed the Oregon Department of Forestry to monitor the effectiveness of the rules and report those findings to the Board of Forestry (OAR 620-620-700). In particular, the goal of this study was to test the effectiveness of the forest practice rules in protecting fish-bearing (Type F) and domestic use (Type D) streams from unacceptable drift contamination during aerial applications of forest pesticides.

This study was designed through a subcommittee of the rule revision committee. The subcommittee members (page IV) represented the National Coalition for Alternatives to Pesticides, private landowners, Department of Environmental Quality, Oregon Department of Agriculture, Oregon State University, city water commissions, National Council for Air and Stream Improvement, private monitoring consultants, and Oregon Department of Forestry. This subcommittee reviewed and approved the methods described and implemented for this study.

Rules and Regulations

The Oregon Department of Forestry (ODF) regulates forestry operations on non-federal forestland. Landowners and operators are subject to the *Oregon Forest Practices Act* when they conduct any commercial activity relating to the growing or harvesting of trees. The Oregon Forest Practices Act (FPA) was adopted in 1972. The overarching objective of the act is to:

“encourage economically efficient forest practices that assure the continuous growing and harvesting of forest tree species and the maintenance of forestland for such purposes as the leading use on privately owned land, consistent with sound management of soil, air, water, fish and wildlife resources and scenic resources within visually sensitive corridors as provided by ORS 527.755 that assures the continuous benefits of those resources for future generations of Oregonians.” (ORS 527.630 Policy, Oregon Forest Practices Act)

The Oregon Board of Forestry has been vested with exclusive authority to develop and enforce statewide and regional rules. The forest practice rules are designed to address the resource issues identified in the FPA objective. The rules are categorized into divisions, and each division has a description of purpose. The purpose statements further refine the broad objectives of the rules and act.

The focus of this monitoring project was on a subset of Division 620: Chemical and Other Petroleum Product Rules. The purpose of the Division 620 rules is to “ensure that chemicals used on forestland do not occur in the soil, air or waters of the state in quantities that would be injurious to water quality or to the overall maintenance of terrestrial or aquatic life.” While “chemicals” is defined in Oregon Administrative Rule 629-600-100 (11) as all classes of pesticides, plant regulators, petroleum products used as carriers, and adjuvants (e.g. surfactants, control additives), this study only monitored herbicides and fungicides. Note that the rule does not require that all measurable concentrations of chemicals in the waters of the state be avoided. Instead, the rule focuses on requiring best

management practices that are intended to ensure that chemicals do not reach the waters of the state at concentrations that could be injurious to water quality and terrestrial or aquatic life.

In addition to compliance with ODF regulations, operations involving the use of pesticides are also subject to related laws administered by the Oregon Department of Agriculture, Department of Environmental Quality, Occupational Safety and Health Division, Water Resources Department, and the Health Division (OAR 629-620-000).

As stated earlier, this study focused on aerial applications of herbicides and, to a lesser extent, fungicides. The rules regarding aerial application of these pesticides maintain that operators shall only apply them under weather conditions that will protect non-target resources and comply with the product label (OAR 629-620-400 (3)). Direct aerial herbicide application may not occur within 60 feet of significant wetlands, Type F or D streams, large lakes, other lakes with fish use, and other areas of open water larger than one-quarter acre at the time of application (OAR 629-620-400 (4)). No herbicide application buffer is specified in the chemical rules for streams which are neither Type F nor D (Type N streams). However, all herbicide applications must be conducted in compliance with the product label and also ensure the retention of the riparian vegetation components required by the forest practices water protection rules.

Direct aerial application of fungicides may not occur within 300 feet of significant wetlands, Type F or D streams, large lakes, other lakes with fish use, other areas of open water larger than one-quarter acre at time of application, and within 60 feet of flowing Type N streams (OAR 629-620-400 (7)). This study focused on Type F and D streams, although three Type N streams were sampled. These Type N streams had overstory vegetative buffers, a practice not required for Type N streams. See Table A-1 in Appendix A for details on buffer requirements for all aerial chemical applications.

Forest Practices Monitoring Program

The Aerial Pesticide Application Monitoring Project is just one component of the forest practices monitoring program (Dent 1998) and is an example of effectiveness monitoring. A set of monitoring questions has been developed which guide monitoring efforts in determining if the forest practice rules are *effective (effectiveness monitoring)*, *implemented properly (compliance monitoring)*, and based on *accurate assumptions (validation monitoring)*. The monitoring questions were formulated with significant input from the public and vested interest groups during the 1994 strategic planning process. The forest practices monitoring program currently coordinates separate projects to monitor compliance with forest practice rules and the effectiveness of forest practice rules with regard to landslides, riparian function, stream temperature, juvenile fish passage, and sediment delivery from forest roads. Validation monitoring is being conducted to test the basic assumptions underlying the riparian forest practice rules.

Past Findings With Regard to Aerial Application of Pesticides

Water Sampling Results

Forest pesticide monitoring has taken place in Washington and Oregon over the past 16 years. Results from three different studies indicate that the majority of the 24-hour-average composite samples contained either no detectable residue or less than 1.0 ppb of the applied pesticide (Figure 1). From 1980 to 1987, ODF implemented a water-sampling program to assess the effectiveness of the forest practice rules (in effect at the time) at protecting the waters of the state (Oregon Department of Forestry, Forest Practices Monitoring Program 1992). A representative subset of total pesticide applications was monitored totaling 153 water samples. Of 153 samples analyzed, 86 percent (132 samples) resulted in no detectable pesticide residue. A subsequent study was carried out from 1989 to

1990 by ODF to assess herbicide applications again. Of 52 samples analyzed, 83 percent (43 samples) resulted in no detectable herbicide.

The Washington Timber Fish and Wildlife Program (TFW) intensively monitored six operations during 1991 (Rashin and Graver 1993). Of six samples analyzed, 83 percent (5 samples) contained 0.13 to 0.56 parts per billion (ppb) of the applied herbicide. Results of these three studies indicate that under most conditions, pesticide concentrations greater than 1 ppb are relatively rare as a result of forest operations.

Peak Concentrations Generated By Precipitation

Additional peaks in pesticide concentrations may occur after the first rainfall and subsequent runoff. Sufficiently large precipitation which expands the ephemeral stream system can result in flowing water coming into contact with pesticide deposits (Ice 1994; Norris 1980). The potential for subsequent peaks depends on the elapsed time between the pesticide application and the first runoff event, the expansion of the channel, the decay rate of the pesticide and the antecedent storm conditions. Professional judgment must be used to determine when there is sufficient rainfall to produce runoff. In the TFW study, the authors determined that rainfall events that occurred within the first 72 hours of the operation were the most important. They recommended sampling within the initial 12 hours after runoff begins.

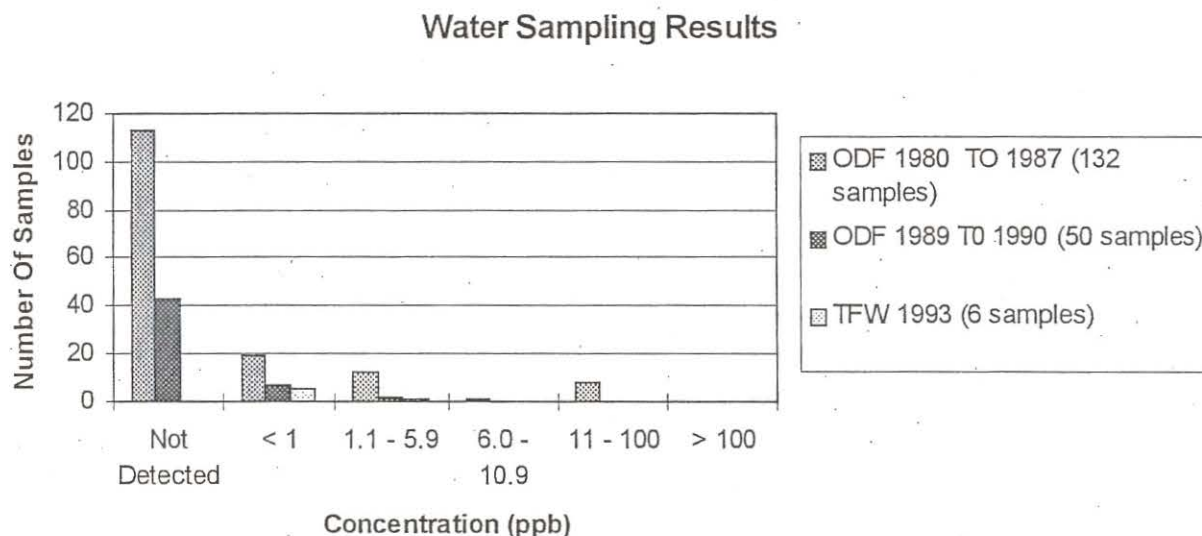


Figure 1. Pesticide Monitoring Results From Three Studies in Washington and Oregon

A 1999 study (Michael et al.) conducted in Alabama (in which hexazinone was applied well above the legal Oregon FPA level), found that the concentration of herbicide peaked several times from increased streamflow as long as 30 days after application. However, this study was designed to test the effects of hexazinone on aquatic insects. The application rate was three times the operationally prescribed rate, most likely in an attempt to assure that herbicide contamination would occur, and involved the application of pellet and liquid form of hexazinone.

Study Design

Monitoring Questions

This project was designed to answer the following monitoring questions:

Are forest practice rules protecting water quality from drift contamination during aerial applications of pesticides?

Are forest practice rules protecting riparian vegetation during aerial applications of herbicides?

In order to answer these questions ODF collected water quality samples on 26 volunteered herbicide and fungicide applications and surveyed riparian vegetation on 24 RMAs from 14 randomly selected harvest units. The 40 operations monitored in this project represent 2.1% of the average number of herbicide and fungicide applications (1,896) completed each year in the 1990's. However, this annual average (1,896) number of operations includes all aerial, hand, and roadside herbicide and fungicide applications. Therefore, the 40 sites monitored and surveyed for this study actually represent a portion of *aerial* applications at some level greater than 2.1%.

Trained field crews under the supervision of the ODF monitoring coordinator implemented the majority of this monitoring project. Other forest practices staff, landowners, and operators coordinated on different aspects of the project. Water quality monitoring took place in the spring and fall, while the vegetation surveys took place in the summer and fall. The Oregon Department of Agriculture (ODA) laboratory analyzed the water quality samples.

Water Quality Sampling Design

Nineteen sites were sampled in the Fall of 1997 and seven sites in the Spring of 1999. The sites were treated with either herbicides or fungicides. There were no insecticide operations conducted during the sampling period so this practice could not be monitored. Six samples were collected at each spray operation: one before the operation (control), and one each at 15 minutes, 2 hours, 4 hours, 8 hours, and 24 hours after the operation.

Sample Location Samples were collected approximately 0 to 200 feet downstream of the treatment unit boundary. Sample sites were accessed without walking or driving through the treatment units. The collection sites, had a uniform cross-section (no backwater or eddies) and had adequate flow to facilitate sample collection.

Sample Timing A control sample was collected within approximately one to two hours prior to application. The post-operation samples were timed to capture set intervals after the parcel of stream water that would have been in the unit during the application flowed through the sample location. The timing of sample collection was, therefore, based on the travel time of the water moving through the treatment unit. For example, the time of collection for the 15-minute sample was calculated as follows:

$$L / v / 60 \text{ seconds} + 15 \text{ minutes} = 15 \text{ minute sample time}$$

L = length (feet) of stream between top of treatment unit and sample point plus length (feet) of stream between bottom of treatment unit and sample point divided by 2

v = average stream velocity (ft / sec), measured with a velocity meter before control sample collection

Runoff Sampling The goal of ODF was to implement runoff sampling at all sites where a runoff event occurred within the first 72 hours of the pesticide application. This was not implemented for the 19 operations sampled in 1997 due to lack of resources. However, runoff-generating precipitation events were noted during the first 24 hours after spray for three of the Fall 1997 sample sites, effectively making seven of the preset-interval samples collected for these three sites runoff samples. The 72-hour runoff sampling procedure was implemented for the 1999 sample operations. However, no runoff-generating events occurred within 72 hours of application for any of the seven 1999 sample operations.

Collection Procedures The Oregon Department of Agriculture (ODA) laboratory has defined specific container and storage temperature requirements for given chemicals. These procedures were followed for ODF's sampling program. Monitoring personnel arrived at the sampling site without physical contact with vehicles or personnel from the spray operation and complied with the following procedure:

1. All equipment was clean and free of chemical residues. For each sample, a new pair of surgical-type sanitary gloves and pick up container were used.
2. Two labels were filled out and placed on bottle and lid. When using a plastic container, the sample number was written directly on the bottle as well as on the label.
3. Samples were taken while standing downstream of the sample location. Clothing was not allowed to make contact with the water.
4. Triple-rinsing of the sample container was done at the sample site, with rinse water emptied downstream.
5. While facing upstream, container was slowly sunk into the main flow of the water column until the lip was just below the surface and filled container.
6. ODF Water Quality Sampling forms were filled out (Figure A-3, Appendix A).

Sample Storage and Delivery to ODA Laboratory Samples were immediately put into watertight cold storage with a leak-proof cooling device (blue-ice, frozen water jugs, double-bagged ice cubes) and remained so until analyzed. Samples were transported to the laboratory as soon as possible. At no time were samples in contact with personnel directly involved with the pesticide application.

Selecting the Test Pesticide and Method Detection Limits

Often times, more than one chemical was applied in solution to a given site. The pesticide active ingredient applied at the highest concentration was selected for testing. After obtaining the brand name and the ounces per acre of all chemicals applied (from the landowner/operator) in the solution, the following formula was used to identify the pesticide active ingredient being applied with the highest concentration:

$$(\% \text{ Concentration}) * (\text{Applied ounces per acre}) = \text{Actual ounces per acre}$$

This is the chemical that was tested for in the lab. Percent concentrations of chemicals were derived from label information. Table A-2 in Appendix A provides information for commonly encountered brand names.

The method detection limit (mdl) defines the lowest concentration at which the indicated contaminant can be detected. Samples from 21 sites were tested at an mdl of 1 ppb. This means that if the pesticide active ingredient

was present at levels of 1 ppb or greater, the lab would have detected it. The remaining samples from five sites were tested at mdls of 0.04, 0.1, 0.5 ppb. These samples were tested at a lower limit due to a miscommunication with the lab. All these detection limits are well below what is currently considered injurious to human health and aquatic and terrestrial life (see Evaluation Methods section in this paper). Such low mdls were selected in the event that the current state of knowledge regarding these "toxicity criteria" should change.

Riparian Vegetation Protection

Effectiveness of forest practice rules in protecting riparian vegetation during aerial herbicide applications was evaluated as part of the ODF's Best Management Practices Compliance Monitoring Project (BMPCMP). The BMPCMP is an ongoing project (1998-2001) that evaluates randomly-selected harvest operations throughout the state for compliance with various forest practice rules. During herbicide applications, the riparian vegetation identified by the water protection rules must be protected. "Protection" means no direct application and no damage resulting in the loss of function of the riparian area. Protection of understory and overstory vegetation from aerial herbicide applications was surveyed on 24 RMAs from 14 randomly selected harvest operations. Herbicide application occurred six to eighteen months prior to the field evaluation.

Evenly spaced transects were established every 100 to 200 feet depending on the length of the RMA, with transects perpendicular to the stream. Along each transect the crew surveyed understory and overstory vegetation for impacts from aerial herbicide applications (e.g. deformed or curled leaves, spotting, or dead vegetation).

Operator Questionnaire. The operators/landowners filled out a questionnaire (Table A-4, Appendix A) describing the aerial application. This questionnaire provided information on chemicals applied, weather conditions, application rates, flight and equipment specifications, and offset from stream edge.

Site and Operation Characteristics

Sixteen sites were located in the Coast Range georegion, eight in the Interior georegion, and two in the Western Cascades georegion. Figure 2 shows the general location of each sample site. Twelve small, nine medium, and five large streams were sampled from these georegions. Twenty-one were Type F streams, three were Type D streams, and two were Type N streams. The Type N streams (both small) had overstory canopies similar to those found along Type F streams, a practice not required for small Type N streams. Table 1 displays the characteristics for each site. Stream widths averaged nine feet, with average velocity and stream flow of one foot per second and one cubic foot per second, respectively. The average stream length through the harvest unit was approximately 2000 feet.

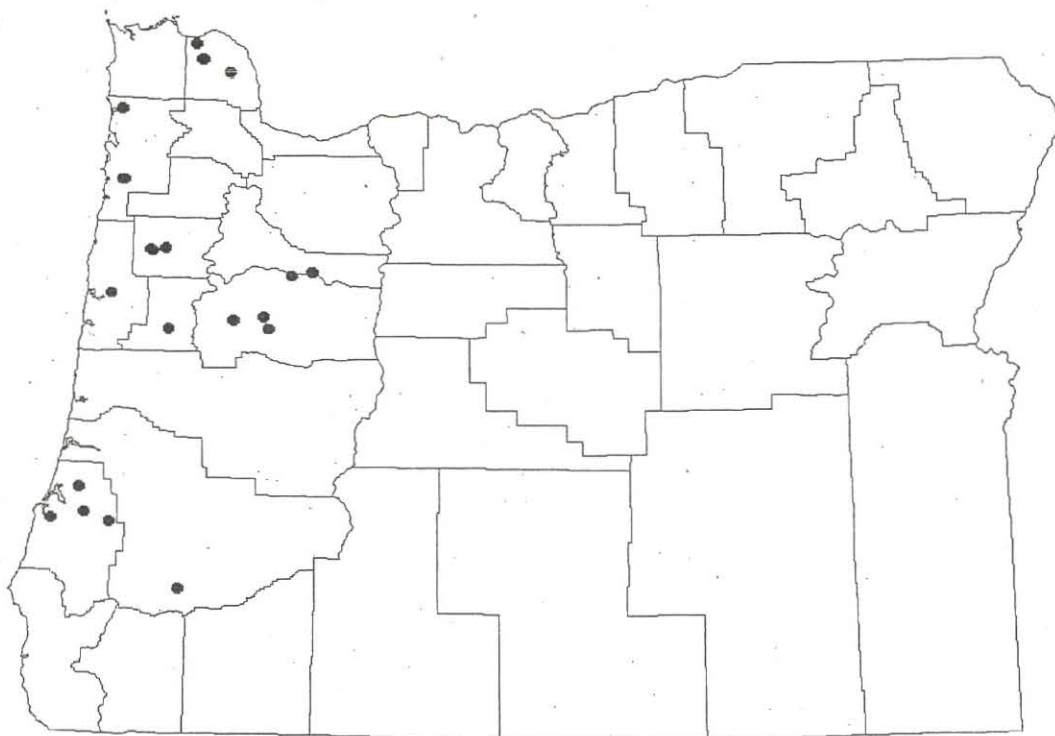


Figure 2. Water Quality Monitoring Operation Locations. Oregon with county lines; dots represent sampling locations.

Operation characteristics such as weather conditions, application rates, and application methods are detailed in Table 2 and Table 3. Average wind speed was 1 mph. Average relative humidity and air temperature was 79% and 64°F, respectively. Flight altitude and speed averaged 34 feet and 46 mph, respectively. On average, aerial herbicide and fungicide applications along Type F and D streams and fungicide applications along flowing Type N streams (all 26 sites) were 100 feet away from stream edges (60-foot buffer required by FPA). The two aerial applications of fungicide along Type F streams stayed 300 feet away from the stream edges (300-foot buffer required by FPA). See Table A-1 in Appendix A for complete buffer requirements.

In general, aerial pesticide applications consisted of mixtures of multiple products along with surfactants (Table 3). Water quality samples were tested for the pesticide present in the highest concentration at each site. There were seven different pesticides that appeared in highest concentrations and were tested for. They included 12 sites with glyphosate; four with chlorothalonil; three with 2,4-D ester; two each with tryclopyr, clopyralid, and hexazinone; and one with sulfometuron (see Table 3). See Table B-1 in Appendix B for operational equipment used and Appendix C for site maps showing spray boundary and sampling location.

Table 1. Site Characteristics

Site #	Year	Geo-region*	Stream Size	Stream Type	Avg. Vel. (ft/s)	Stream Flow** (ft ³ /s)	Wetted Width (ft)	Length of Stream (ft)	Sample Dist. to Unit (ft)	FPA Required Buffer (ft)
1	1997	CR	S	F	0.81	-	-	1000	150	300
2	1997	CR	S	N	0.74	-	-	1000	125	60
3	1997	IN	S	D	0.05	-	-	1300	100	60
4	1997	CR	S	N	0.74	-	-	1000	200	60
5	1997	CR	S	F	0.81	-	-	1000	200	300
6	1997	CR	L	F	0.27	-	26	1932	44	60
7	1997	CR	S	F	0.05	0.27	-	1600	227	60
8	1997	IN	S	F	0.81	0.34	2.5	4500	189	60
9	1997	CR	M	F	1.8	-	-	1000	50	60
10	1997	CR	L	F	3	-	-	1500	50	60
11	1997	CR	M	F	2.5	4.87	4.5	3000	150	60
12	1997	IN	M	F	2	1.14	3.5	1000	100	60
13	1997	WC	S	D	3	-	-	600	0	60
14	1997	WC	S	D	3	-	-	100	700	60
15	1997	CR	M	F	0.27	0.2	2.5	1400	170	60
16	1997	IN	S	F	1	-	-	1600	200	60
17	1997	CR	L	F	0.5	-	25	1500	10	60
18	1997	CR	M	F	0.4	2.72	4	400	0	60
19	1997	CR	S	F	0.28	0.25	3.5	3850	150	60
20	1999	CR	S	F	0.23	-	3	800	200	60
21	1999	CR	M	F	1.8	-	11	3900	164	60
22	1999	CR	M	F	1.31	-	8	1300	165	60
23	1999	IN	L	F	1.9	-	18	7780	160	60
24	1999	IN	M	F	4.56	-	9	2300	100	60
25	1999	IN	M	F	1.63	-	9	3200	143	60
26	1999	IN	L	F	1.43	-	11	3920	150	60
		Average			1	1	9	2019	150	
		Maximum			0.05	0.2	2.5	100	0	
		Minimum			4.56	4.87	26	7780	700	

* CR = Coast Range, IN = Interior, WC = Western Cascades.

** - = No data available

▨ = sites 1, 2, 4, and 5 were fungicide applications, all others were herbicide applications

Table 2. Weather Conditions and Operations Characteristics

Site #	Applicat. Season	Runoff Event	Wind Speed** (mph)	Wind Direction*	Relative Humid. (%)	Air Temp. (°F)	Flight Altitude (ft)	Flight Speed (mph)	Actual Buffer Width
1	Fall	No	0	NA	89	55	10	40	300
2	Fall	No	0	NA	75	61	10	40	250
3	Fall	No	4	SE	54	58	15	37	257
4	Fall	Yes	0	NA	100	65	10	40	200
5	Fall	Yes	0	NA	100	65	10	40	300
6	Fall	No	0	NA	90	62	30-150	45	60-100
7	Fall	No	0	NA	95	55	40-50	45	60-100
8	Fall	Yes	-	-	-	-	-	-	-
9	Fall	No	1-2	N	82	54	10-50	55	-
10	Fall	No	-	-	-	-	-	-	-
11	Fall	No	0-2	SW	65	71	30	45	60-100
12	Fall	No	0-3	E	75	65	<50	45	60-100
13	Fall	No	1-2	SE	-	-	-	-	-
14	Fall	No	1-3	SE	-	-	-	-	-
15	Fall	No	2-3	SW	93	64	40-60	45	60-100
16	Fall	No	0	NA	58	67	varies	55	>60
17	Fall	No	1-3	SE	88	57	40-60	45	60-100
18	Fall	No	-	-	-	-	-	-	-
19	Fall	No	0	NA	94	62	40-60	45	60-100
20	Spring	No	0	NA	76	54	40	45	>60
21	Spring	No	1-2	E	56	54	10-20	50	60-100
22	Spring	No	1-2	NE	83	83	10-20	50	60-100
23	Spring	No	0	NA	65	65	30	49	>100
24	Spring	No	2-3	NW	74	74	20-70	45	>100
25	Spring	No	1-5	NE	91	91	60	45	60-100
26	Spring	No	2-3	SW	65	65	25	50	100
		Average	1		79	64	34	46	110 [#]
		Maximum	4		100	91	90	55	257
		Minimum	0		54	54	10	37	60

* NA = Wind direction not applicable for wind speeds of zero.

** - = Data not available

[#] = Average spray buffer from stream for herbicide applications only, excludes fungicide applications

☐ = sites 1, 2, 4, and 5 were fungicide applications, all others were herbicide applications

Table 3. Target Pest, Chemicals Applied and Rate Information

Site #	Spray Target	Pesticide Brand Name	Use Rate (oz/ac)	Pesticide Active Ingredient	Percent Concen. (%)	Actual Rate (oz/ac)	Other Pestic.	Use Rate* (oz/ac)	Surfactant Added	Use Rate* (oz/ac)	Carriers Used**	Mix Rate** (gal/ac)
1	Swiss Needle Cast	Bravo Weather Stik	88	Chlorothalonil	54	47.5	None	NA	None	NA	-	30
2	Swiss Needle Cast	Bravo Weather Stik	88	Chlorothalonil	54	47.5	None	NA	None	NA	-	30
3	Alder	Weedone LV6	32	2, 4-D ester	83.5	26.7	None	NA	None	NA	water	10
4	Swiss Needle Cast	Bravo Weather Stik	88	Chlorothalonil	54	47.5	None	NA	None	NA	-	30
5	Swiss Needle Cast	Bravo Weather Stik	88	Chlorothalonil	54	47.5	None	NA	None	NA	-	30
6	Misc. brush and maple	Accord	48	Glyphosate	41.5	19.9	Arsenal Oust Escort	6 3 1	Sylgard 309	3.2	water	10
7	Misc. brush and grasses	Accord	64	Glyphosate	41.5	26.6	Escort Oust	3 1	Activator 90	8	water	10
8	-	Accord	64	Glyphosate	41.5	26.6	Oust	3	R-11	8	-	-
9	Misc. brush and grasses	Accord	48	Glyphosate	41.5	19.9	Arsenal Oust Escort	4 4 1	NU-Film	4	water	-
10	-	Accord	48	Glyphosate	41.5	19.9	Arsenal	5	Activator 90	2	-	-
11	Misc. brush and grasses	Accord	48	Glyphosate	41.5	19.9	Oust	3	LI 700	2	-	-
12	Maple and grasses	Accord	80	Glyphosate	41.5	33.2	Oust	3	Sylgard 309	3.2	water	10
13	-	Garlon 4	32	Triclopyr	61.6	19.7	Oust	2	Bivert STA-PUT	6 4	water	-
14	-	Garlon 4	32	Triclopyr	61.6	19.7	Oust	2	Bivert STA-PUT	6 4	water	-
15	Misc. brush and maple	Accord	40	Glyphosate	41.5	16.6	Oust	3	Activator 90	2	water	5
16	Misc. brush and maple	Accord	64	Glyphosate	41.5	26.6	Arsenal Oust	6 3	Sylgard 309	3.2	water	10
17	Grasses and maple	Accord	40	Glyphosate	41.5	16.6	Oust	3	Activator 90	2	water	5
18	-	Accord	48	Glyphosate	41.5	19.9	Arsenal Oust	8 3	R-11	16	water	5
19	Misc. brush and maple	Accord	40	Glyphosate	41.5	16.6	Oust	3	Activator 90	2	water	
20	Misc. brush and grasses	Transline	8	Clopyralid	0.41	3.3	Oust	2	None	NA	Water	5
21	Misc. weeds and grasses	Transline	8	Clopyralid	0.41	3.3	Oust	2	None	NA	Water	-
22	Misc. weed and grasses	Velpar	64	Hexazinone	0.25	16	Oust	2	None	NA	Water	-
23	Madrone and oak	Low Vol 6	46	2,4-D	83.5	38.4	Garlon 4	61.6	None	NA	Water Diesel	6 3.5
24	Misc. brush and grasses	Velpar	64	Hexazinone	0.25	16	Oust	3	None	NA	Water	10
25	Misc. brush and alder	Low Vol 6	64	2,4-D	88.8	56.8	None	NA	STA-PUT	6.4	Water	-
26	Misc. brush and grasses	Oust	3	Sulfometuron	0.75	2.25	None	NA	None	NA	Water	10

* NA = Not applicable

** - = Data not available

■ = sites 1, 2, 4, and 5 were fungicide applications, all others were herbicide applications

Table 4. Surface Water Quality Criteria for Forest Chemicals. (Provided by Dr. N. I. Kerkvliet, OSU Extension Toxicology Specialist). Water Quality Criteria expressed as an average 24-hour concentration in surface water. All values in parts per billion (ppb).

CHEMICAL	HUMAN HEALTH (10 day HA ^a)	FISH 48- or 96-hr LC ₅₀ ^{aa} (100-fold safety factor)	INVERTEBRATES 48- or 96 hr LC ₅₀
MOST COMMONLY APPLIED FOREST HERBICIDES			
2,4-D amine	300	salmon 3500	daphnia 4000
2,4-D ester	300	bluegill 7	daphnia 100
Atrazine	100	trout 45	midge 720
Clopyralid	500 ^{ab}	trout 1030	daphnia 2.25 x 10 ⁵
Glyphosate (w/o surfactant)	17500	salmon 6800	daphnia 9.3x10 ⁵
Glyphosate (w/surfactant)	17500	trout 13	daphnia 300
Hexazinone	2500 ^b	trout 3200	daphnia 52000
Imazapyr	10000 ^{bb}	trout 1100	daphnia 3.5x10 ⁵
Metsulfuron methyl	2500 ^c	trout 1500 ^d	daphnia 1.5x10 ^{5d}
Sulfometuron methyl	1000 ^e	trout 125 ^f	daphnia 12500 ^f
Triclopyr amine	50 ^g	trout 1170	daphnia 1.2x10 ^{5h}
Triclopyr ester	50	trout 7.4	no data found
MOST COMMONLY APPLIED FOREST INSECTICIDES			
<u>Bacillus thuringiensis</u>	exempt	trout >12x10 ⁹ spores/L	N/A
Carbaryl	1000	brook trout 6.9	stonefly 1.7 to 29
			daphnia 5.6
Diffubenzuron	200 ⁱ	trout 1350	stonefly 2.0
			daphnia 0.015
MOST COMMONLY APPLIED FOREST FUNGICIDES			
Chlorothalonil	200	trout 0.5	daphnia 70
FERTILIZERS			
Free Ammonia	no data	salmon 83	general 53 to 22,800
Nitrate -N	10,000 ^j	no data	no data
Ammonia-N	500	no data	no data
Ammonium sulfamate	30,000 ^k	carp 10,000	no data
DIESEL (used as a carrier)	no data	fish 1.9	no data

Footnotes to Table 1:

a) unless otherwise indicated. HA = health advisory

aa) LC₅₀ = lethal concentration for 50% of population

ab) based on Reference Dose (RFD) of 0.5 mg/kg/day

b) 90-day HA

bb) based on rabbit no observed effect level (NOEL) of 400 mg/kg/day, 400-fold safety factor

c) based on RFD of 0.25 mg/kg

d) based on LC₅₀ > 150 mg/L

e) based on RFD of 0.1 mg/kg

f) based on LC₅₀ > 12.5 mg/L

g) based on 1-yr dog No Observable Effects Level (NOEL) of 0.5 mg/kg/day

h) based on 21-day calculated concentration which retards 50% of growth (EC₅₀)

i) based on 1-yr dog NOEL of 2 mg/kg/day

j) MCL = Maximum Contaminant Level

k) lifetime HA

Evaluation Methods

Protection of Water Quality

Since the forest practice rules allow for minute, but measurable, concentrations of applicable chemicals to reach waters of the state, rule effectiveness depends on determining if such concentrations are considered injurious to water quality or terrestrial or aquatic life. Therefore, the forest practices staff, with input from Dr. Nancy Kerkvliet (Oregon State University) and Dr. Robert Pratt (Portland State University), developed Surface Water Quality Criteria for Forest Chemical Operations (Table 4). These criteria, expressed as the 24-hour average concentration, were developed in 1996 from current toxicological studies as a basis for evaluating pesticide and fertilizer monitoring results. The water quality results of this monitoring study were compared against these values to evaluate whether identified drift contamination levels were a cause for concern for aquatic biota and human health.

The surface water quality criteria are based on extended (chronic) pesticide and fertilizer exposure, even though it is assumed that drift contamination from a forest operation should only result in short-term (acute) exposure. Therefore, it was assumed that these criteria represent concentrations at which it is highly unlikely that any long-term adverse impacts would occur for humans, fish, or aquatic invertebrates (Kerkvliet, et. al 1996). Even so, it must also be emphasized that these numbers are not intended to represent permissible pollution levels (Norris and Dost 1992). A more appropriate interpretation is to view the criteria as "thresholds of concern" that should trigger more intensive monitoring if often exceeded even though BMPs are followed.

Protection of Riparian Vegetation

Effectiveness of the rules in protecting riparian vegetation was determined based on visible damage or destruction of overstory and understory riparian vegetation that resulted from aerial herbicide applications. The percent of the riparian area damaged was measured and reported.

Results

Protection of Water Quality from Drift Contamination

One control sample and five post-spray samples were collected on each of 26 sites, for a total of 130 post-spray samples. Each of these samples were analyzed individually to determine concentrations of the pesticide throughout time. There was no detectable pesticide in any of the control samples. The remainder of this section addresses the post-spray samples.

Samples from 21 sites (105 post-spray samples) were tested at a method detection limit (mdl) of 1 ppb. The 24-hour sample from site 24 was lost during analysis, so a result for this sample is not available (bringing this total down to 104 post-spray samples).

The detection limit was even lower than 1 ppb for samples from the remaining five sites. These 25 post-spray samples were tested at mdls that ranged from 0.04 to 0.5 ppb (Table 5). The detection limits used in analyzing all the water quality samples (at least 1 ppb) are well below the concentrations listed in the surface water quality criteria (Table 4).

No pesticide was detected at concentrations ≥ 1 ppb. Pesticide was only detected in a subset of the samples tested at mdls < 1 ppb. Hexazinone and 2,4-D were detected in samples from two of the five sites tested at mdls below 1 ppb (Figure 3). For site 22, Hexazinone was detected in all five of the post-spray samples (mdl = 0.1 ppb). The concentrations were 0.9, 0.34, 0.51, 0.56, and 0.1 (for the 15 min, 2-, 4-, 8-, and 24-hour samples, respectively)

(Figure 4). For site 25, 2,4-D was detected in two of the five post-spray samples (mdl = 0.1 ppb). The concentrations were 0.14, and 0.14 for the 4 and 8 hour samples (Figure 4). There were no pesticides detected in the samples for the three other sites (15 post spray samples) that were tested at mdls of 0.5 and 0.04 ppb. This includes results from one site (five post-spray samples) treated with oust and tested at an mdl of 0.04 ppb.

Operation Characteristics for Sites with Drift Contamination

Original plans for this project were to analyze the operation and weather data for sites with detectable drift contamination. However, because all detected contamination levels were below 1 ppb and only five sites were tested at an mdl below 1 ppb, analysis of these conditions would not be statistically valuable. Stream, wheather, application, chemical, and equipment data are provided in Tables 1, 2, 3, 4, and Table B-1 Appendix B and discussed in the Site and Operation Characteristics section.

Protection of Water Quality from Runoff Contamination

Measurable runoff-generating precipitation occurred during the first 24 hours following pesticide application for three of the sites sampled in 1997. For sites 4 and 5, the 4-, 8-, and 24-hour samples were affected by precipitation and initial runoff, as well as the 24-hour sample for site 8. No detectable levels (mdl = 1 ppb) of pesticides were found in any of the seven samples for these three sites. There were no runoff-generating precipitation events within the first 24 hours following application nor within the 72 hours for any of the 1999 sample sites.

Protection of Riparian Vegetation

Twenty-four RMAs adjacent to aerial pesticide applications were evaluated by the BMP Compliance Monitoring Project (BMPCMP) for protection of riparian vegetation from direct herbicide application or spray drift. These RMAs were on seven small, eight medium, and nine large Type F streams from 14 operations. RMA lengths varied from 200 feet to 2500 feet. The RMA widths varied from 10-100 feet, and riparian prescriptions included no-harvest buffers, harvest to basal area standard target, site specific prescriptions, and hardwood conversions (Table 6).

The BMPCMP found no herbicide application damage to the riparian vegetation that is required to be protected by the water protection rules. As well, this study found no evidence of direct herbicide application within the 60-foot offset required by the forest practice rules along Type F and D streams. Please refer to the BMPCMP protocol (Dent and Robben 1998), Pilot Study Report (Dent and Robben 1999), and final report (due in late 2001) for further information on compliance monitoring.

Table 5. Water Sample Pesticide Analysis Results

Site #	Season	Length of Unit (ft)	Chemical Tested	Method Detection Limit (ppb)	Runoff Samples	Sample Results *					
						Control 1	15 min 2	2 hr 3	4 hr 4	8 hr 5	24 hr 6
1	Fall 97	1000	Chlorothalonil	1	None	NDL	NDL	NDL	NDL	NDL	NDL
2	Fall 97	1000	Chlorothalonil	1	None	NDL	NDL	NDL	NDL	NDL	NDL
3	Fall 97	1320	2, 4-D ester	1	None	NT**	NDL	NDL	NDL	NDL	NDL
4	Fall 97	Unk.	Chlorothalonil	1	# 4,5,6	NDL	NDL	NDL	NDL	NDL	NDL
5	Fall 97	Unk.	Chlorothalonil	1	# 4,5,6	NDL	NDL	NDL	NDL	NDL	NDL
6	Fall 97	1932	Glyphosate	1	None	NDL	NDL	NDL	NDL	NDL	NDL
7	Fall 97	1600	Glyphosate	1	None	NDL	NDL	NDL	NDL	NDL	NDL
8	Fall 97	4500	Glyphosate	1	# 6	NDL	NDL	NDL	NDL	NDL	NDL
9	Fall 97	1000	Glyphosate	1	None	NDL	NDL	NDL	NDL	NDL	NDL
10	Fall 97	1500	Glyphosate	1	None	NDL	NDL	NDL	NDL	NDL	NDL
11	Fall 97	3000	Glyphosate	1	None	NDL	NDL	NDL	NDL	NDL	NDL
12	Fall 97	1000	Glyphosate	1	None	NDL	NDL	NDL	NDL	NDL	NDL
13	Fall 97	400	Triclopyr	1	None	NDL	NDL	NDL	NDL	NDL	NDL
14	Fall 97	900	Triclopyr	1	None	NDL	NDL	NDL	NDL	NDL	NDL
15	Fall 97	1400	Glyphosate	1	None	NDL	NDL	NDL	NDL	NDL	NDL
16	Fall 97	1600	Glyphosate	1	None	NDL	NDL	NDL	NDL	NDL	NDL
17	Fall 97	1500	Glyphosate	1	None	NDL	NDL	NDL	NDL	NDL	NDL
18	Fall 97	400	Glyphosate	1	None	NDL	NDL	NDL	NDL	NDL	NDL
19	Fall 97	3850	Glyphosate	1	None	NDL	NDL	NDL	NDL	NDL	NDL
20	Spring 99	800	Clpyralid	0.5	None	NDL	NDL	NDL	NDL	NDL	NDL
21	Spring 99	3900	Clpyralid	0.5	None	NDL	NDL	NDL	NDL	NDL	NDL
22	Spring 99	1300	Hexazinone	0.1	None	NDL	0.9	0.34	0.51	0.56	0.1
23	Spring 99	7780	2,4-D	1	None	NDL	NDL	NDL	NDL	NDL	NDL
24	Spring 99	2300	Hexazinone	1	None	NDL	NDL	NDL	NDL	NDL	NA***
25	Spring 99	3200	2,4-D	0.1	None	NDL	NDL	NDL	0.14	0.14	NDL
26	Spring 99	3920	Sulfometuron	0.04	None	NDL	NDL	NDL	NDL	NDL	NDL

* NDL = No detectable level

** NT = control sample not tested

*** NA = Sample lost, result not available

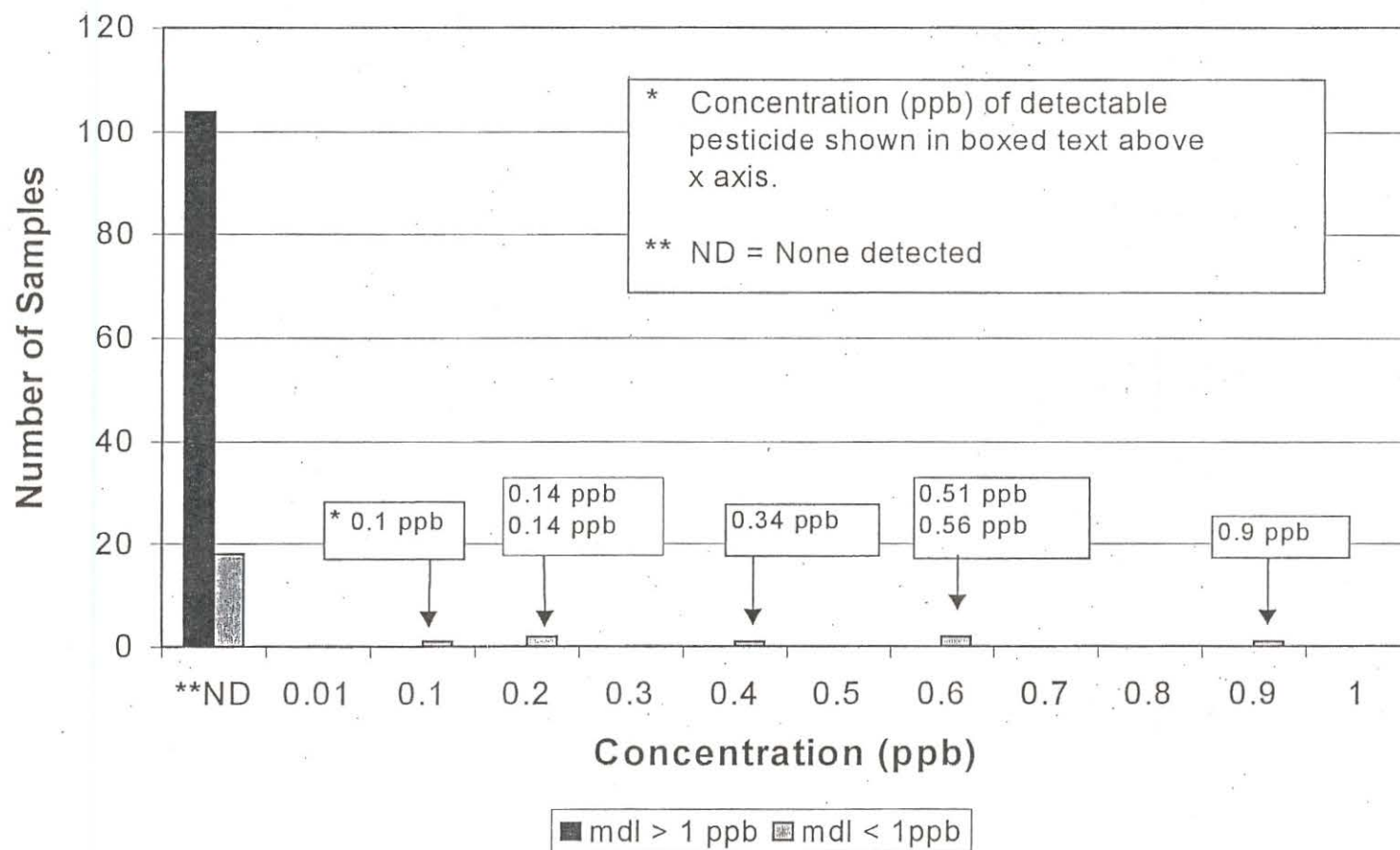
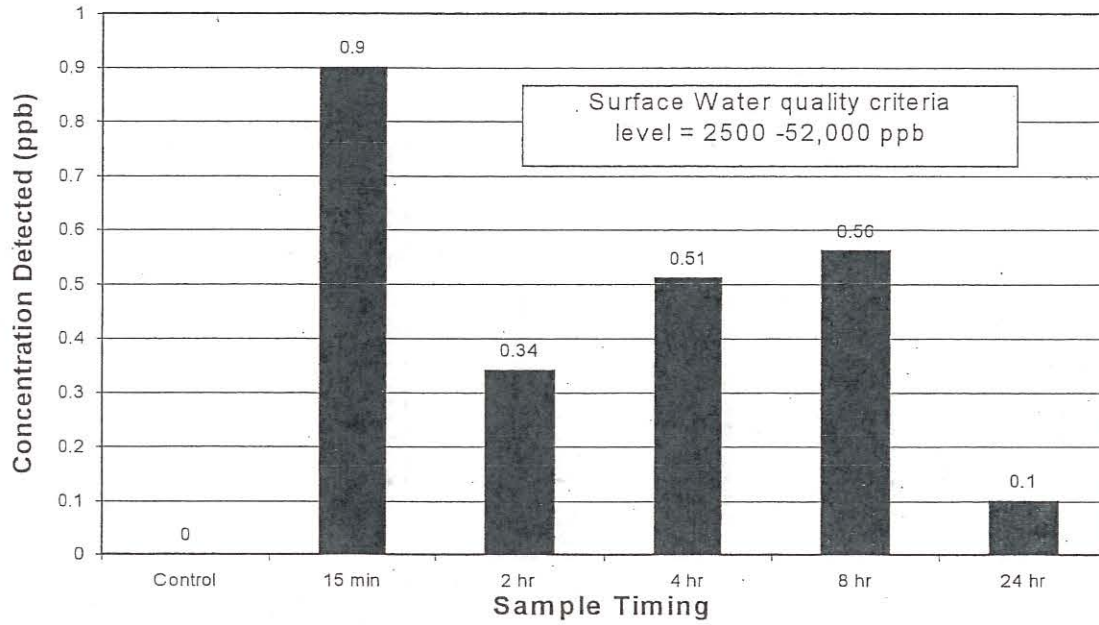


Figure 3. Concentrations of Pesticides Detected in 129 Post-Spray Samples from 26 operations (mdl = 0.04-1.0). Seven out of 25 samples tested at mdl < 1 ppb contained trace concentrations of pesticide.

Site 22: Hexazinone (Velpar)
Method Detection Limit = 0.1 ppb



Site 25: 2,4-D ester (Low Vol 6)
Method Detection Limit = 0.1 ppb

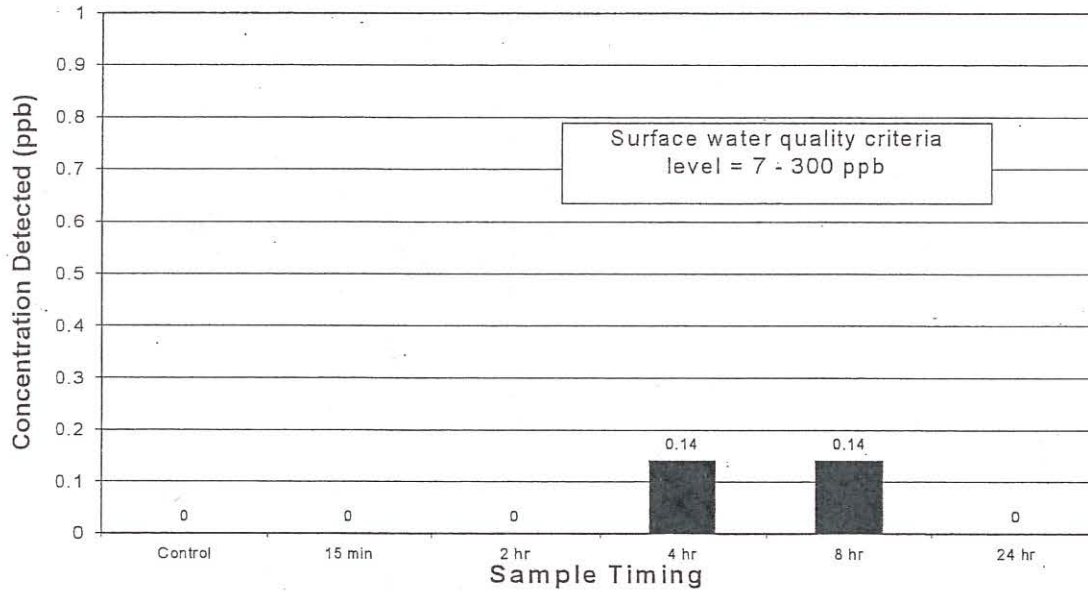


Figure 4. Pesticide Concentration Levels Detected in Water Samples from Sites 22 and 25.

Table 6. Impacts to Riparian Vegetation from Aerial Herbicide Applications. Assessed by the ODF Best Management Practices Compliance Monitoring Project.

BMPCMP RMA #	Year Surveyed	Stream Size	Stream Type	Stream Length (ft)	RMA Prescription (code)*	Riparian Overstory Canopy Wd.(ft)#	RMA Spray/Drift Impacts
5A	1998	M	F	900	BW	70	No
5B	1998	M	F	900	BW	70	No
5C	1998	L	F	2500	BW	100	No
14A	1998	M	F	400	BW	70	No
14B	1998	S	F	500	BA	42	No
14C	1998	S	F	1350	BA	32	No
18A	1998	S	F	800	SS	50	No
19A	1998	M	F	1200	BW	70	No
25A	1998	M	F	1200	SS	34	No
28A	1998	L	F	4000	BW	100	No
30A	1998	L	F	2600	BA	80	No
30B	1998	L	F	1200	BA	82	No
31A	1998	S	F	2500	BW	50	No
31B	1998	M	F	1000	BW	69	No
38A	1998	M	F	1500	BA	-	No
38B	1998	M	F	1890	BA	-	No
40A	1998	S	F	740	BW	49	No
40B	1998	S	F	2000	BW	50	No
41A	1998	S	F	200	BW	50	No
52A	1998	L	F	600	HWC	10	No
52B	1998	L	F	200	HWC	30	No
52C	1998	L	F	550	HWC	10	No
21A	1999	L	F	500	BW	93	No
77A	1999	L	F	1500	BW	100	No

- * BW = Buffer width, no RMA harvest
 BA = Basal area general prescription
 SS = Site specific RMA prescription
 HWC = Hardwood conversion (Alternate Prescription # 2)

- = Data not available, standing buffer width not measured

Summary and Conclusions

The Oregon Department of Forestry conducted a project to monitor the effectiveness of forest practice rules in protecting water quality and riparian vegetation during aerial application of pesticides. The project was implemented in 1997 and 1999. One control and five post-spray water samples were collected from 26 streams adjacent to aerial forest pesticide applications in western Oregon. Samples from 21 sites were tested at an mdl of 1ppb. Samples from five sites were tested at an mdl of less than 1 ppb. Three sites (seven samples) were affected by runoff generating rainfall within the first 24 hours of applications. Riparian vegetation surveys were conducted on an additional 24 RMAs from 14 operations to determine if riparian vegetation is adequately protected from aerial applications of herbicides.

Monitoring Question #1

Are forest practice rules protecting water quality from drift contamination during aerial application of pesticides?

Based on current understanding of the toxicity of commonly used forest pesticides with regard to human health and aquatic biota, the authors conclude that forest practice rules are effective at protecting water quality during aerial herbicide and fungicide applications on Type F and D streams. These results pertain to contamination from drift or direct application on Type F and D streams. The Type N streams sampled here had vegetation and spray-boundary offset buffers similar to those of Type F streams. Issues concerning other mechanisms of contamination were not addressed with this study. Furthermore, the effectiveness of water quality protection on streams without overstory riparian buffers or offset spray boundaries (typical practice on Type N streams) was not evaluated.

No pesticide contamination levels at or above 1 ppb were found in any of the post-spray samples analyzed. Seven of the 25 post-spray samples (for 2 of 5 sites) that were tested at levels lower than 1 ppb (mdl 0.5 to 0.04 ppb) were found to contain trace levels of the applied pesticide. Contamination levels ranged from 0.1 to 0.9 ppb. The contaminants included hexazinone from site 22 and 2 4-D ester from site 25. The forest practice rules allow for some level of contamination as long as it is not harmful to aquatic or terrestrial life, human health, or water quality.

Current literature and ODF monitoring criteria indicate that thresholds of concern for human health and aquatic biota start at levels much higher than 1 ppb (see Table 4). The surface water quality criteria for hexazinone (found in five samples from site 22) are 2500 for human health, 3200 for trout health, and 52,000 ppb based on daphnia mortality. The surface water quality criteria for 2 4-D ester (found in two samples from site 25) are 300 ppb for human health, 7 ppb based on bluegill health, and 100 ppb based on daphnia mortality (Table 4).

The hexazinone thresholds were confirmed with an Alabama study that looked at the effects of hexazinone on aquatic insects (Michael et al. 1999). The authors observed maximum concentrations of the herbicide hexazinone at 422 and 473 ppb. These concentrations resulted from intentional direct spray of the stream. The authors concluded that aquatic insects were not sensitive to hexazinone even at these levels.

Runoff-generating precipitation did not result in detectable contamination levels in any of the applicable samples from three sites (seven samples). Efforts were made to collect additional data on runoff

contamination but were not completed due to lack of runoff within 72 hours of application or because of coordination issues.

Monitoring Question #2

Are forest practice rules protecting riparian vegetation during aerial application of pesticides?

Forest practice rules are effective at protecting understory and overstory riparian vegetation on Type F and D streams during aerial application of herbicides. There was no damage to riparian vegetation protected by the FPA water quality rules that occurred as a result of herbicide applications on 24 RMAs along Type F streams.

Recommendations

When this protocol was adopted, current research indicated the highest peaks of contamination occurred within 24 hours of a forest pesticide application. Additional peaks were considered possible if a runoff generating event occurred within 72 hours of application. This study assessed water quality protection primarily on Type F and D streams. The focus was on the first 24 hours after aerial application with a secondary goal of looking at runoff contamination that might occur within 72 hours of the application. Therefore, the conclusions apply to potential contamination resulting from drift or direct spray on streams that have overstory riparian buffers as required under current Oregon forest practices rules.

Future Monitoring

This study was not able to address the issues of delayed impacts to water quality that might occur as a result of other mechanisms besides drift or direct applications. Currently, there is no significant research was identified to indicate that contamination will occur from runoff events occurring beyond 72 hours of a typical forest operation, such as those represented by these data. Until such time as research demonstrates other mechanisms and timing of water quality contamination, chemical monitoring is a low priority for the Forest Practices Section. Continued water sampling will occur as needed to respond to public complaints and to facilitate enforcement action.

If chemical monitoring is prioritized in the future, the focus should consider a number of topics that were not addressed by this study. One of the goals of this study was to monitor the effectiveness of the new rules with regard to non-biological insecticides. There were no large-scale insecticide applications during the course of this study and so this goal was not met. Therefore, the highest priority for future monitoring should be on non-biological insecticides.

This study also did not address water quality protection of streams that do not have an overstory riparian buffer (small Type N streams). Furthermore, this study did not address surfactants, "inert" ingredients, or fertilizers. This study was not selective in terms of a particular herbicide focus. Future monitoring should consider if there is any reason to focus efforts on particular herbicides. For example, Oust (sulfometuron) was commonly used but in such small concentrations that it was only tested for once. In addition, the ODA laboratory only recently developed the methodology to test for it.

Policy

These results indicate that the rules are effective at protecting water quality on Type F and D streams. If the current scientific knowledge of hazard levels for human and aquatic biota do not change, no changes are recommended to the forest practice rules.

The department, in partnership with the research community, should continue to refine the surface water quality criteria to address new pesticides (e.g. clopyralid) and to incorporate new information derived from toxicological studies.

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Appendix A:
Buffer Requirements, Pesticide Label Information, and Field Forms

Table A-1. Buffer Requirements for Different Types of Water Bodies When Chemicals are Applied on Forestland Under the Forest Practice Rules

Required Chemical Application Buffers for Waters of the State	Herbicides, rodenticides, biological insecticides, and All other chemicals except fungicides, Non-biological Insecticides, and Fertilizers.		Fungicides and Non-biological Insecticides		Fertilizers	
	Aerial Applications	Ground Applications	Aerial Applications	Ground Applications	Aerial Applications	Ground Applications
Aquatic areas of fish bearing streams with no domestic use (most Type F streams)	60 feet	10 feet	300 feet	10 feet	No direct application	No direct application
Aquatic areas of domestic use streams (all Type D and some Type F streams)	60 feet	10 feet	300 feet	10 feet	100 feet	100 feet
Aquatic areas of other streams (Type N streams)	No Buffer Specified	No Buffer Specified	60 feet if flowing at time of application	No Buffer Specified	No direct application to large and medium streams	No direct application to large and medium streams
Significant wetlands	60 feet	10 feet	300 feet	10 feet	No direct application	No direct application
Aquatic areas of lakes larger than 8 acres	60 feet	10 feet	300 feet	10 feet	No direct application	No direct application
Aquatic areas of other lakes with fish use.	60 feet	10 feet	300 feet	10 feet	No direct application	No direct application
Other standing water larger than ¼ acre at time of application.	60 feet	10 feet	300 feet	10 feet	No direct application	No direct application
All other waters	No Special Buffer required	No Buffer Specified	No Buffer Specified	No Buffer Specified	No Buffer Specified	No Buffer Specified

Table A-2. Test Pesticide Selection

Often times more than one chemical is applied in solution. The pesticide applied at the highest concentration will be tested for. After obtaining the brand name and the applied ounces per acre from the landowner/operator, use the following formula and Table 3 to identify the pesticide being applied with the highest concentration. This is the chemical that will be tested for in the lab.

$(\% \text{ Concentration}) * (\text{Applied ounces per acre}) = \text{Actual ounces per acre.}$

Table A-2. Forest pesticides brand names, active ingredients and concentrations

<u>Brand Name</u>	<u>Active Ingredient</u>	<u>% Concentration</u>
<u>Herbicides:</u>		
Low Vol 6	2,4-D	88.8
Amine 4 2,4-D	2,4-D	46.5
Weedar 64	2,4-D	46.8
Weedone LV4	2,4-D	60.8
Weedone LV6	2,4-D	83.5
Amine 4	2,4-D	47.3
Lo Vol-4	2,4-D	67.2
Lo Vol-6	2,4-D	87.3
Tordon 101	2,4-DP	49.8
Aatrex Nine-O	Atrazine	85.5
Atrazine 90 DF	Atrazine	85.5
Conifer 90	Atrazine	85.5
Accord	Glyphosate	41.5
Velpar	Hexazinone	25
Arsenal	Imazapyr	53.1
Chopper	Imazapyr	3.6
Escort	Metsulfuron methyl	60
Access	Picloram, Triclopyr	17.1, 32.5
Oust	Sulfometuron methyl	75
Garlon 4	Triclopyr	61.6
Garlon 3A	Triclopyr	44.4
Pathfinder	Triclopyr	16.7
Transline	Clopyradil	40.9
<u>Fungicides:</u>		
Bravo 720	Chlorothalonil	54
<u>Insecticides:</u>		
DiPel 6AF	<u>Bacillus thuringiensis (BT)</u>	2.15
Thuricide 48LV	<u>Bacillus thuringiensis (BT)</u>	2.4
Thuricide 32LV	<u>Bacillus thuringiensis (BT)</u>	1.6
Sevin 4-OIL ULV	Carbaryl	47.5
Sevimol	Carbaryl	40
<u>Rodenticides:</u>		
ORCO	Strychnine	0.5

Figure A-3. Water Quality Pesticide Sampling Form

Obtain or draw schematic map of unit, streams, buffers, and flight patterns.

Notification number: _____

Stream name: _____

Applied pesticide: _____

Basin name: _____

Monitoring personnel name(s): _____

Spray start time: _____

Average stream velocity (v): _____ (ft/sec)

Distance from closest spray boundary to sampling area (l): _____

Distance from lower boundary to upper boundary (L): _____

'15 minute' sampling time: $(L+l)/2 * 1/v * 1/60$ seconds + 15 = _____ minutes

Determine which pesticide to test for:

	<u>Chemical</u>	<u>% Concentration</u>	<u>Applied ounces per acre</u>	<u>Actual ounces per acre</u>
1)				
2)				
3)				
4)				

Get 'chemical' and the 'applied ounces/acre' information from the landowner. Use Table 3 to determine the % concentration for a given pesticide. Multiply '% concentration' by 'applied ounces/acre' to determine 'actual ounces/acre' for every pesticide that is applied. The pesticide with the highest value for actual ounces per acre will be tested for in the laboratory.

Pesticide to test for at the ≤ 2 ppb level of concentration: _____

Sampling start time: _____ Date: _____

SAMPLE DESCRIPTION	SAMPLE COLLECTION		SAMPLE ID NUMBER
	DATE	TIME	
Control Sample			
'15 minute'			
2 hour			
4 hour			
8 hour			
24 hour			
Runoff Sample #1 (opt)			
Runoff Sample #2 (opt)			
Runoff Sample #3 (opt)			

Figure A-4. Operator Questionnaire: Weather, Chemicals, Application, and Equipment

Landowner: _____
Person completing questionnaire (name): _____
Unit Name: _____
Date of Application: _____

Weather Conditions:

Please fill in measurements of:

Time	_____	_____	_____	_____	_____	_____	_____
Wind speed	_____	_____	_____	_____	_____	_____	_____
Wind Direction	_____	_____	_____	_____	_____	_____	_____
Relative Humidity	_____	_____	_____	_____	_____	_____	_____
Temperature	_____	_____	_____	_____	_____	_____	_____

Chemical Application

Start time _____

End time _____

On average, the chemical was applied 0-40 40-60 60-100 100+ feet from the stream. (Circle one)

Target vegetation/pest: _____

Active ingredient pesticide: _____ oz/acre applied _____

Active ingredient pesticide: _____ oz/acre applied _____

Active ingredient pesticide: _____ oz/acre applied _____

Surfactant added: _____ oz/acre _____

Carriers used: _____

EPA Registration number _____ Trade Name _____

Operation

Helicopter model: _____

Flight altitude: _____

Air speed: _____

Boom length: _____ Boom Pressure _____

Flight centerline offset from edge of buffer: _____

Half Boom used ____ Yes ____ No

Nozzle type, size, angle, orientation: _____

Number of nozzles: _____

Appendix B:
Pesticide Application Operational Data

Table B-1. Application Equipment Used

Site #	Vehicle Used	Flight Altit.* (ft)	Flight Speed (mph)	Boom Length (ft)	Pressure (psi)	Half Boom Used	# of Nozzles	Buffer Offset (ft)
1	Helicopter	10	40	32	32	Y	31	200
2	Helicopter	10	40	32	32	Y	31	200
3	Helicopter	15	37	30	30	Y	30	25
4	Helicopter	10	40	32	32	Y	31	200
5	Helicopter	10	40	32	32	Y	31	200
6	Helicopter	30-150	45	33	28	Y	34	0
7	Helicopter	40-50	45	32	25-30	Y	32	16
8	Helicopter	-	-	-	-	-	-	-
9	Helicopter	10-50	55	36	25	Y	37	30
10	Helicopter	-	-	-	-	-	-	-
11	Helicopter	30	45	33	28	Y	34	-
12	Helicopter	<50	45	34	30	Y	38	25
13	Helicopter	-	-	-	-	-	-	-
14	Helicopter	-	-	-	-	-	-	-
15	Helicopter	40-60	45	31	25	Y	36	-
16	Helicopter	varies	55	36	25	Y	37	varies
17	Helicopter	40-60	45	31	25	Y	36	-
18	Helicopter	-	-	-	-	-	-	-
19	Helicopter	40-60	45	31	25	Y	36	-
20	Helicopter	40	45	36	25	Y	37	-
21	Helicopter	10-20	50	40	23	Y	38	20
22	Helicopter	10-20	50	40	23	Y	38	20
23	Helicopter	30	49	40	20	Y	40	-
24	Helicopter	20-70	45	35	30	Y	38	100
25	Helicopter	60	45	32	25-28	Y	28	-
26	Helicopter	25	50	40	-	Y	38	20
	Average	34	46	34	27		35	81
	Maximum	10	37	30	20		28	0
	Minimum	90	55	40	32		40	200

* - = Data not available

Appendix C: Site Maps

Oregon Department of Forestry
Best Management Practices
Compliance Monitoring Project:
Final Report

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OREGON DEPARTMENT OF FORESTRY
FOREST PRACTICES MONITORING PROGRAM
TECHNICAL REPORT 15

April 2002

ACKNOWLEDGEMENTS

Erin Gilbert, Jim Ziobro, Jeff Peck, Conrad Tull, and Keith Mills were all instrumental in the study design and implementation of this project. Erin Gilbert, Kristin Cotugno, Kyle Abraham, and Conrad Tull were all responsible for data collection. Cassandra Webber, Julie Welp, and Kathleen Gomez provided valuable project support. Ted Lorensen and David Morman prioritized this project for the monitoring program.

This project would not have been possible without the participation of private landowners and managers, including Boise Cascade Corp.; Cascade Timber Consulting; ECM Partners; Forestree Ltd. Partnership; Frank Lumber Co.; Freres Lumber Co.; Giustina Resources; Hampton Resources; Hogan Family Partnership; Jeld-Wen, Inc.; John Hancock Mutual Life Insurance Co.; J-Spears Ranch Company; KOGAP Enterprises; Lone Rock Timber Co.; Longview Fibre Co.; Malheur Lumber Co.; Menasha Corp.; Miami Corp.; Moore Mill & Lumber Co.; Olympic Resource Management; Pioneer Resources; Port Blakely Tree Farms; River Bend Resources; Rosboro Lumber Co.; Roseburg Resources Co.; Schmidlin Bros. Forest Management; Seneca-Jones Timber Co.; Shiloh Forest Enterprises; Silver Butte Timber Co.; Simpson Timber Co.; South Coast Lumber Co.; Starker Forests, Inc.; Swanson-Superior Forest Products, Inc.; The Timber Company; Timber Products Co.; Timber Service Co.; U.S. Timberlands; Weyerhaeuser Co.; Willamette Industries, Inc.; Woodland Management, Inc.; Woodward Stuckart LLC; Worden Enterprises, Inc.; Yaquina Forestry; and numerous small, private landowners. Also critical to this project was the assistance of representatives from the City of Coos Bay, Hood River County Forestry Dept., Josephine County Forestry Dept., Washington County Forestry Dept., Oregon Parks and Recreation Dept., and the Port of Gold Beach.

The external and internal review committee provided valuable input over a four-year period. The authors would also like to thank all the forest practice foresters and ODF State Lands foresters and engineers who made the site selection process possible, contacted landowners, and arranged logistics to support the field team.

TABLE OF CONTENTS

COMMITTEES AND COORDINATORS	i
INTERNAL REVIEW COMMITTEE	i
EXTERNAL REVIEW COMMITTEE	i
PROJECT COORDINATORS	i
INTRODUCTION	1
BACKGROUND	2
COMPLIANCE MONITORING IN OTHER STATES	3
RELATED MONITORING AND RESEARCH	5
OBJECTIVES AND MONITORING QUESTIONS	6
OBJECTIVES	6
MONITORING QUESTIONS	6
STUDY DESIGN	7
SITE SELECTION	7
Defining the Population	7
Stratification	7
Selection	8
SITE CHARACTERISTICS	9
RULE FOCUS	10
FIELD AND ANALYTICAL METHODS	11
COMPLIANCE RATING SYSTEM	11
Administrative Noncompliance	11
Potential Resource Impact	11
Resource Impact	11
NUMERIC DATA COLLECTION	12
QUALITY ASSURANCE AND QUALITY CONTROL	12
SEDIMENT SOURCES	12
CALCULATING COMPLIANCE	13
RESULTS	14
UNIT-LEVEL COMPLIANCE	14
Unit Noncompliant Practices	15
Unit Compliance Trends in Ownership	15

RULE-LEVEL COMPLIANCE	15
Reforestation (OAR 629-610).....	17
Treatment of Slash (OAR 629-615).....	18
Chemical and Other Petroleum Products (OAR 629-620).....	18
Road Construction and Maintenance (OAR 629-625).....	19
Harvesting (OAR 629-630).....	25
Vegetation Retention Along Streams (OAR 629-640).....	29
Protection Measures for Significant Wetlands (OAR 629-645).....	37
Riparian Management Areas and Protection Measures for Lakes (OAR 629-650).....	38
Protection Measures for Other Wetlands (OAR 629-655).....	38
Miscellaneous Water Protection Rules (OAR 629-660).....	38
Administrative Requirements (From All Divisions).....	38
FINDINGS	41
MONITORING QUESTION 1	41
Unit-Level Compliance.....	41
Rule-Level Compliance.....	42
MONITORING QUESTION 2	43
MONITORING QUESTION 3	43
Forest Practices Forester (FPF) Inspections.....	43
Statistical Representation.....	44
MONITORING QUESTION 4	44
Compliance and Sample Size.....	44
Areas of Higher Compliance.....	45
Areas of Lower Compliance	45
MONITORING QUESTION 5	47
Slash Accumulations.....	48
Riparian Vegetation Damage.....	49
Alteration of Bed or Banks.....	49
Sediment Delivery	49
RECOMMENDATIONS.....	51
RAISE AWARENESS AND UNDERSTANDING OF KEY FINDINGS.....	51
UPDATE RULES AND GUIDANCE	52
PROVIDE FOR ADMINISTRATION AND ENFORCEMENT	52
CONSIDER RELATED MONITORING.....	53

REFERENCES	55
APPENDIX A	58
APPENDIX B	63
APPENDIX C	65
APPENDIX D	67

LIST OF TABLES

TABLE 1.	OREGON DEPARTMENT OF FORESTRY ADMINISTRATIVE RULES	1
TABLE 2.	LANDOWNER POPULATION CHARACTERISTICS	8
TABLE 3.	UNITS REVIEWED DURING SELECTION PROCESS WHICH DID NOT MEET SURVEY CRITERIA	8
TABLE 4.	UNITS SURVEYED BY OWNERSHIP AND STREAM CLASS FOR EACH ODF DISTRICT	10
TABLE 5.	UNIT-LEVEL COMPLIANCE RATES BY OWNERSHIP CLASS	15
TABLE 6.	RULES AND REGULATIONS SECTIONS MONITORED	16
TABLE 7.	COMPLIANCE RESULTS FOR RMA REFORESTATION TIMING RULES	17
TABLE 8.	COMPLIANCE RESULTS FOR TREATMENT OF SLASH RULES	18
TABLE 9.	COMPLIANCE RESULTS FOR PETROLEUM-RELATED RULES	19
TABLE 10.	COMPLIANCE RESULTS FOR CHEMICAL APPLICATION RULES	19
TABLE 11.	COMPLIANCE RESULTS FOR ROAD LOCATION RULES	20
TABLE 12.	PERCENT OF NEW AND EXISTING ROAD LENGTHS IN EACH LOCATION CATEGORY	20
TABLE 13.	COMPLIANCE RESULTS FOR ROAD PRISM DESIGN RULES	20
TABLE 14.	COMPLIANCE RATES FOR ROAD STREAM CROSSING DESIGN RULES	21
TABLE 15.	CHARACTERISTICS OF 208 ROAD STREAM CROSSINGS SURVEYED	21
TABLE 16.	COMPLIANCE RATES FOR ROAD DRAINAGE DESIGN RULES	22
TABLE 17.	DISTRIBUTION OF ROAD DRAINAGE DESIGN INSTALLED	22
TABLE 18.	UNFILTERED DITCH LENGTH DRAINING TO CHANNEL AT NEW STREAM CROSSINGS	23
TABLE 19.	COMPLIANCE RATES FOR ROAD DRAINAGE MAINTENANCE RULES	23
TABLE 20.	DISTRIBUTION OF ROAD DRAINAGE MAINTENANCE CONDITION	24
TABLE 21.	COMPLIANCE RESULTS FOR ROAD WASTE AND STABILIZATION RULES	24
TABLE 22.	COMPLIANCE RATES FOR VACATED ROAD RULES	24
TABLE 23.	COMPLIANCE RATES FOR ROCK PIT RULES	25
TABLE 24.	COMPLIANCE RATES FOR GENERAL YARDING PRACTICES RULES	25
TABLE 25.	COMPLIANCE RATES FOR FELLING AND HARVESTING SLASH RULES	26
TABLE 26.	COMPLIANCE RATES FOR CABLE YARDING NEAR WOS RULES	26
TABLE 27.	COMPLIANCE RATES FOR GROUND EQUIPMENT NEAR WOS	27
TABLE 28.	COMPLIANCE RATES FOR HARVESTING WASTE RULES	27
TABLE 29.	COMPLIANCE RATES FOR LANDING RULES	27
TABLE 30.	COMPLIANCE RATES FOR SKID TRAIL RULES	28

TABLE 31.	SKID TRAIL LOCATION DISTRIBUTION.....	28
TABLE 32.	SKID TRAIL DRAINAGE.....	28
TABLE 33.	COMPLIANCE RATES FOR TEMPORARY CROSSING RULES	29
TABLE 34.	NUMBER OF STREAMS, TOTAL LENGTH, AND RMA WIDTH BY STREAM SIZE AND TYPE CLASS.....	30
TABLE 35.	COMPLIANCE RATES FOR VEGETATION RETENTION RULES FOR TYPE F RMAS	30
TABLE 36.	HARVEST PRESCRIPTIONS FOR TYPE F RMAS SURVEYED	31
TABLE 37.	COMPLIANCE RATES FOR VEGETATION RETENTION RULES FOR TYPE N AND D RMAS	37
TABLE 38.	COMPLIANCE RATES FOR SIGNIFICANT WETLAND PROTECTION RULES	38
TABLE 39.	COMPLIANCE RATES FOR OTHER WETLAND PROTECTION RULES	38
TABLE 40.	COMPLIANCE RATES FOR MISCELLANEOUS WATER PROTECTION RULES.....	38
TABLE 41.	COMPLIANCE RATES FOR NOTIFICATION RULES.....	39
TABLE 42.	COMPLIANCE RATES FOR PRIOR APPROVAL RULES.....	40
TABLE 43.	COMPLIANCE RATES FOR WRITTEN PLAN RULES.....	41
TABLE 44.	COMPLIANCE RATES FOR RULE SECTIONS.....	42
TABLE 45.	AVERAGE COMPLIANCE RATES FOR RULES BASED ON NUMBER OF TIMES APPLIED	44
TABLE 46.	RIPARIAN AND STREAM CHANNEL IMPACTS OF NONCOMPLIANT PRACTICES	48
TABLE A-1.	UNIT COMPLIANCE DATA.....	59
TABLE C-1.	REPEATED MEASUREMENT OF ROAD LOCATION CLASSIFICATION	66
TABLE C-2.	REPEATED MEASUREMENT OF ROAD DRAINAGE CLASSIFICATION	66
TABLE C-3.	REPEATED MEASUREMENT OF RMA WIDTHS	66
TABLE C-4.	REPEATED MEASUREMENT OF RMA TREE COUNTS.....	66
TABLE C-5.	REPEATED MEASUREMENT OF RMA RETAINED BASAL AREA.....	66

LIST OF FIGURES

FIGURE 1.	LOCATION OF UNITS SURVEYED FOR BMP COMPLIANCE.....	9
FIGURE 2.	DISTRIBUTION OF UNITS BY OWNERSHIP CLASS.....	10
FIGURE 3.	SOURCES OF RULE COMPLIANCE DETERMINATION.....	13
FIGURE 4.	FREQUENCY DISTRIBUTION OF UNIT-LEVEL COMPLIANCE RATES.....	14
FIGURE 5.	COMPLIANCE RATES FOR RULE SECTIONS.....	17
FIGURE 6.	RIPARIAN PRESCRIPTION AND OWNERSHIP CLASS	31
FIGURE 7.	BUFFER RETENTION FOR NO-HARVEST PRESCRIPTION RMAS.....	33
FIGURE 8.	RELATIVE RETENTION FOR BASAL AREA PRESCRIPTION RMAS.....	34
FIGURE 9.	TREE COUNT RETENTION FOR BASAL AREA PRESCRIPTION RMAS.....	35
FIGURE 10.	FREQUENCY DISTRIBUTION OF UNIT-LEVEL COMPLIANCE RATES.....	42
FIGURE 11.	1987-2000 COMPLIANCE RATES	43
FIGURE 12.	DISTRIBUTION OF SEDIMENT DELIVERY VOLUMES FROM NONCOMPLIANT PRACTICES	50
FIGURE 13.	DISTRIBUTION OF SEDIMENT DELIVERY SOURCES	50
FIGURE B-1.	DRAFT CHECKLIST FOR ACTIVITIES ASSOCIATED WITH WOS REQUIRING PRIOR APPROVAL	64
FIGURE B-2.	DRAFT CHECKLIST FOR ACTIVITIES ASSOCIATED WITH WOS REQUIRING AN APPROVED WRITTEN PLAN.....	64
FIGURE D-1.	OREGON PLAN VOLUNTARY MEASURES	68

COMMITTEES AND COORDINATORS

This study was conducted with the oversight of external and internal review committees. The committees' main functions were to review and approve the study design, methods, and reports. The committees met over the course of four years of development, implementation, analysis, and reporting of the project.

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ODF BMP Compliance Monitoring Project

INTRODUCTION

The Oregon Department of Forestry (ODF) regulates forestry operations on non-federal land. Landowners and operators are subject to the Forest Practices Act and Rules when they conduct any commercial activity relating to the growing or harvesting of trees. The Oregon Forest Practices Act (FPA) was adopted in 1972. The overarching objective of the Act is to

...encourage economically efficient forest practices that assure the continuous growing and harvesting of forest tree species and the maintenance of forestland for such purposes as the leading use on privately owned land, consistent with sound management of soil, air, water, fish and wildlife resources and scenic resources within visually sensitive corridors as provided by ORS 527.755 that assures the continuous benefits of those resources for future generations of Oregonians. (ORS 527.630 Policy, Oregon Forest Practices Act)

The Oregon Board of Forestry has been vested with exclusive authority to develop and enforce statewide and regional Forest Practice Rules. These rules are designed to address the resource issues identified in the FPA policy (sound management of forest, soil, air, water, fish and wildlife resources, and scenic resources). The rules are categorized into divisions (Table 1), each with its own description of purpose. The purpose statements further refine the broad objectives of the Rules and Act. All divisions are within Oregon Administrative Rules chapter 629.

Table 1. Oregon Department of Forestry Administrative Rules

Division	Division Description
600	Definitions
605	Planning Forest Operations
606	Stewardship Agreements
610	Reforestation Rules
611	Afforestation Incentive
615	Treatment of Slash Rules
620	Chemical and Other Petroleum Product Rules
625	Road Construction and Maintenance Rules
630	Harvesting Rules
635	Water Protection Rules: Purpose, Goals, Classification and Riparian Management Areas
640	Water Protection Rules: Wetlands and Riparian Management Areas
645	Water Protection Rules: Riparian Management Areas and Protection Measures for Sign. Wetlands
650	Water Protection Rules: Riparian Management Areas and Protection Measures for Lakes
655	Water Protection Rules: Protection Measures for Other Wetlands, Seeps, and Springs
660	Water Protection Rules: Specified Rules for Operations Near Waters of the State
665	Specified Resource Site Protection Rules
670-680	Civil Penalties, Appeals, Hearings Procedures, Stay of Operations, Access to Notifications and Written Plans, Regional Forest Practice Committees, and the Resource Site Inventory and Protection Process

The Forest Practices Program is responsible for administering and monitoring the Forest Practice Rules. These rules are subject to revision as necessary based on the best available science and monitoring data. Such revisions shall maintain the policy of the FPA as described above. The Rules have undergone many revisions since 1972. The most recent changes to the water protection rules were in 1994, 1995, and

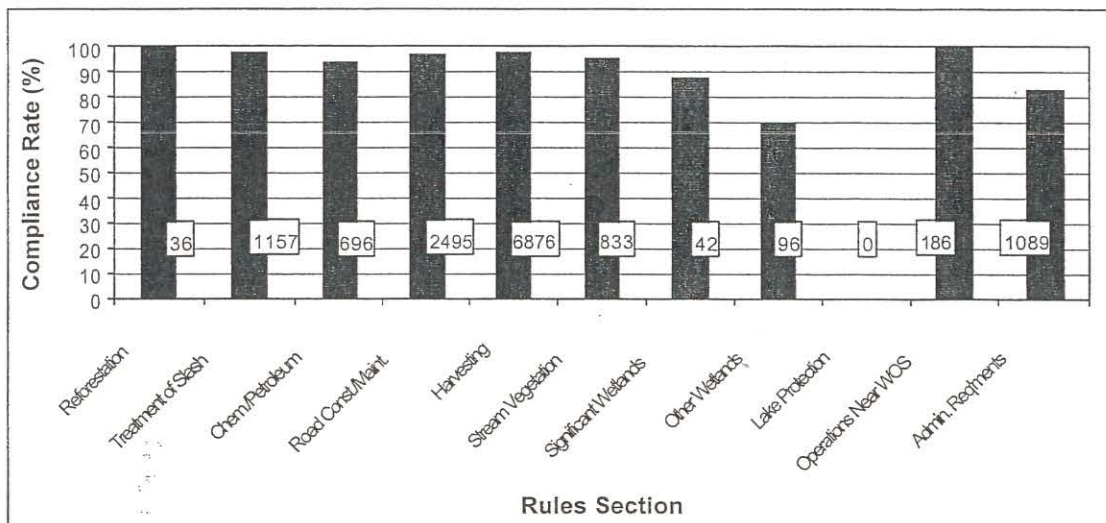


Figure 5. Compliance Rates for Rule Sections

(Number of rule applications surveyed for each section shown in boxes.)

What follows are detailed survey results for each of the specific practices or features surveyed for this project and listed in Table 6. These include total compliance results for each sub-section, individual rule compliance rates, explanation of the source of rule applications, and discussion of cause of noncompliant practices and resulting impacts to water resources.

Reforestation (OAR 629-610)

Compliance was 100% for both reforestation rules evaluated within harvested portions of RMAs. Rules were evaluated on a unit-wide basis, with no issues on any of the units to which they applied (Table 7). The two rules evaluated for this section dealt with the requirements to begin (within 12 months) and complete (within 24 months) reforestation when RMA harvesting reduced trees below the stocking standard. These rules applied to 34 and 2 units, respectively, with the rest of the units surveyed either harvested too recently for these rules to apply or exempted from reforestation requirements by zoning changes to non-forestry land uses.

Table 7. Compliance Results for RMA Reforestation Timing Rules

Rule Applications = total number of rule applications surveyed, Percent Compliant = percent of rule applications compliant, NC: Pot. Impact = noncompliant rule applications with a potential riparian/channel impact (e.g., placement of material in unstable location above stream channel), NC: Impact = Noncompliant rule applications with an observed impact on riparian/channel resources (e.g., sediment delivery to a stream), NC: Admin. = Noncompliant rule applications relating to administrative requirements only (e.g., failure to gain prior approval for harvesting within 100' of a stream)

Rule Number	Rule Description	# Rule Applications	Percent Compliant	NC: Pot. Impact	NC: Impact
629-610- 040 2	RMA Reforestation Begun w/in 12 Months	34	100.0	0	-
629-610- 040 3	RMA Reforestation Completed w/in 24 Months	2	100.0	0	-
Compliance of All Section Rule Applications		36	100.0	0	-

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Treatment of Slash (OAR 629-615)

Compliance was 98.2% for all applications of treatment of slash rules. There were 1,157 total applications of 7 rules in this section (Table 8). These rules applied three aspects of post-harvest disposal of slash: slash around landings that could enter streams, mechanical site preparation near waters of the state, and protection of RMAs during prescribed burning.

Surveys for disposal of unstable slash accumulations (615-100 (2)) at 868 landings revealed 99.2% compliance. Six noncompliant practices had a potential resource impact and one delivered slash to waters of the state. Four mechanical site preparation rules (615-200 (1), (2), (3), (4)) evaluated unit-wide found 14 total noncompliant practices on 77 units. These resulted in seven cases of potential sediment or slash delivery to WOS, five cases of observed slash delivery, and two cases of observed sediment delivery. The lowest compliance in this section was with mechanically-gathered slash placed in a stable location away from WOS (629-615 200 (4)). Compliance was 89.6%, with eight noncompliant practices. The protection of RMA vegetation and removal of RMA slash before burning (615-300 (2d) and (2e)) were 100% compliant for all three units with broadcast burning.

Table 8. Compliance Results for Treatment of Slash Rules

Rule Number	Rule Description	# Rule Applications	Percent Compliant	NC: Pot. Impact	NC: Impact
629-615- 100 2	Landing Slash - Unstable Accumulations Disposed	868	99.2	6	1
629-615- 200 1	Mech. Site Prep. - No Sed./Debris Delivery to WOS	77	94.8	1	3
629-615- 200 2	Mech. Site Prep. - WOS Filtering Distance Provided	77	97.4	2	0
629-615- 200 3	Mech. Site Prep. - RMA Soil Protected	52	100.0	0	0
629-615- 200 4	Mech. Site Prep. - Debris Placed Away From WOS	77	89.6	4	4
629-615- 300 2d	Prescribed Burning - RMA Vegetation Protected	3	100.0	0	0
629-615- 300 2e	Prescribed Burning - Chan./RMA Slash Removed	3	100.0	0	0
Compliance of All Section Rule Applications		1157	98.2	13	8

Chemical and Other Petroleum Products (OAR 629-620)

Compliance was 94.3% for all applications of petroleum product and chemical application rules. There were 696 total applications evaluated for six rules in this section. Compliance rates for individual rules are discussed in two sub-sections titled *Petroleum Products* and *Chemical Applications*. Rule 630-400 (3) is reported here with the Division 620 rules in the *Petroleum Products* sub-section for continuity of all petroleum-related rules.

Petroleum Products. Compliance was 93.3% for the protection of stream and soil resources from petroleum product pollution. There were 567 total applications of three rules in this sub-section. These rules were evaluated for each of the 189 units surveyed. Compliance was 97.9% with the requirement to prevent the leaking of petroleum products (620-100 (1)), with four noncompliant practices due to oil leaks on the ground. No petroleum products were found delivering to WOS, but these cases were potential threats for future water quality. Compliance was 100% for rule 620-100 (2) requiring adequate precaution be taken to ensure no petroleum products enter WOS during the operation. The lowest compliance in this section was with removal of all petroleum-related products from units. Compliance with this rule (630-400 (3)) was 82.0%. Noncompliant practices consisted of oil filters, oil containers, or grease-tubes found on 34 units, mainly at landings. None of these were found near WOS, but were considered to be concerns for future water quality.

Table 9. Compliance Results for Petroleum-Related Rules

Rule Number	Rule Description	# Rule Applications	Percent Compliant	NC: Pot. Impact	NC: Impact
629-620- 100 1	Petroleum Leaks Prevented	189	97.9	4	0
629-620- 100 2	Petroleum Delivery to WOS Prevented	189	100.0	-	0
629-630- 400 3	Petroleum-Related Waste Removed	189	82.0	34	0
Compliance of All Sub-Section Rule Applications		567	93.3	38	0

Chemical Applications. Compliance was 98.4% for all rule applications in this sub-section. There were 129 total applications of three rules evaluated for the protection of waters of the state when applying chemicals (620-400 (1, 2, and 5)). These rules applied to 43 units surveyed with herbicide applications (Table 10). Compliance was 100% with protection requirements for both RMA vegetation and specified water resources. Two noncompliant practices were observed, however, with adherence to product label requirements (95.3% compliance). These were both from the direct application of herbicide to open small wetlands and resulted in vegetation damage.

Table 10. Compliance Results for Chemical Application Rules

Rule Number	Rule Description	# Rule Applications	Percent Compliant	NC: Pot. Impact	NC: Impact
629-620- 400 1	WOS Protected and Label Followed	43	95.3	-	2
629-620- 400 2	RMA Vegetation Protected	43	100.0	-	0
629-620- 400 5	Veg. w/in 10' of Specified WOS Protected	43	100.0	-	0
Compliance of All Sub-Section Rule Applications		129	98.4	-	2

Road Construction and Maintenance (OAR 629-625)

Compliance was 97.6% for all applications of road construction and maintenance rules. There were 2,495 total applications of 33 rules in this section. These rules were evaluated for 80 units with new road construction and 171 units with new or existing roads. New roads are those that were constructed specifically to access the operation being surveyed following the 1996 road regulation revisions and were generally constructed 1-3 years prior to survey.

In total, 148.4 miles of existing road and 38.5 miles of new road were surveyed for BMPs that establish standards for effective road surface drainage. New roads, stream crossings, and rockpits were also evaluated for location, design, construction, and stabilization BMPs relating to providing the maximum practical protection of water quality and fish habitat.

Across all road rules, there were 61 noncompliant practices observed on 41 units. Of these, 23 had no observed impact on riparian or channel conditions, but had the potential to impact resources (unstable material or drainage maintenance issues). The remaining 38 noncompliant practices had observed impacts due to erosion of fill or waste material (13), ineffective surface drainage design (12), inadequate drainage maintenance (10) and machine activity in a channel (3). Resulting resource impacts were sediment delivery (36) and stream channel disturbance (2). The compliance rates of specific road rules are detailed in the road sub-section discussions which follow.

Road Location. Compliance was 100% for rules requiring roads be located to minimize stream crossings and disturbance to water resources (Table 11). There were 240 total applications of three road location rules. Each of these rules applied to the 80 units with new road construction.

DEPOSITION OF AERIALY APPLIED SPRAY TO A STREAM WITHIN A VEGETATIVE BARRIER

H. W. Thistle, G. G. Ice, R. L. Karsky, A. J. Hewitt, G. Dorr

ABSTRACT. *Drift of aerially applied forest herbicides can result in chemical deposition to streams. Riparian vegetation is expected to attenuate drift, but there is little corresponding data. A field study was conducted in the Coast Range west of Corvallis, Oregon, to evaluate the effectiveness of forested riparian buffers. The buffers studied are typical of those used for small and medium fish-bearing streams in western Oregon as mandated by the Oregon Forest Practices Act. A helicopter sprayed two tracers over four transects. Twenty trials were conducted, resulting in over 1400 tracer samples. Results confirm that these vegetative barriers are effective at reducing deposition into streams. Reduction of deposition on artificial foliage samplers placed immediately above the stream surface ranged from 37% to 99% and averaged 92%. Reductions were less clear in stable atmospheric conditions due to low wind speed and highly variable wind directions. Low wind speed conditions are not generally high-drift scenarios, but there is evidence that drift of suspended droplets beyond the barrier, comprising a small fraction of the total mass, increases in stable conditions.*

Keywords. *Aerial application, Drift, Forestry, Herbicide.*

Drift of forest herbicides during aerial applications can result in chemical deposition to streams. It has long been assumed that vegetative barriers attenuate airborne drift. When airborne spray encounters a vegetative barrier, it is expected that some of the material will be captured, but data confirming this are sparse. Ucar and Hall (1999) conducted recent literature reviews of spray capture by vegetative barriers, and Wang and Takle (1995, 1997) and Wang et al. (2001) produced a detailed model of the airflow around vegetative barriers. Tuzet and Wilson (2007) largely confirmed the physical model proposed in the above work. Wilson (2005) indicated that capture by thin windbreaks is not sensitive to relatively small holes or gaps in the windbreak, although it is not clear whether this finding would apply to the thick riparian barriers discussed here (where the "gap" of interest is the low-density trunk space). Bouvet et al. (2006, 2007) tested low barriers of relatively simple geometries. They found significant correlation between data and a physically sophisticated model of deposition and trajectories of fine glass beads, building on

work by Raupach et al. (2001). Teske et al. (2002, 2005) provide summaries of our understanding of how riparian barriers influence drift and deposition into riparian zones and water courses. It is critical to understand how riparian vegetation left undisturbed during timber harvest in accordance with forest practice regulations or dictated best management practices (BMPs) influences drift and prevents deposition to streams.

Examination of airflow data suggests that capture of drifting spray droplets is a complex function of porosity. At high barrier porosity (sparse vegetation), little airborne spray material is captured because of the lack of vegetative surface area. However, at low porosity (dense vegetation), the barrier deflects spray material as the flow streamlines lift over it. Therefore, some intermediate porosity is probably most effective for capturing droplets. A strong wake eddy will form at higher wind speeds and bring material down in the lee of a solid obstacle, and a separation eddy can form in front of the obstacle to bring material down. The strength of these coherent eddies is dependent on barrier density and wind speed as well as atmospheric stability and vertical canopy distribution.

Larger droplets are more strongly influenced by gravity and have greater momentum when approaching a vegetative surface than small droplets (<100 μm). As droplets get smaller, momentum decreases, droplets move with the local wind field, and they are influenced by boundary-layer effects near leaf, needle, and stem surfaces. Small drops also respond more readily to the bulk airflow modification caused by the barrier and will follow airflow streamlines. Streamlines may pass through the barrier, allowing it to capture material, or droplets may follow the airflow streamlines to be captured in the frontal or lee circulation or be carried over the barrier to continue drifting beyond it. There is a substantial body of literature discussing spray droplet capture by vegetative canopies (recent examples include Salyani et al., 2007, and

Submitted for review in May 2009 as manuscript number PM 8039; approved for publication by the Power & Machinery Division of ASABE in September 2009. Presented at the 2007 ASABE Annual Meeting as Paper No. 071148.

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Richardson and Thistle, 2006), but there is very little data addressing the riparian barrier configuration of interest here.

The basic design used in this study to evaluate the influence of a riparian barrier on spray deposition utilizes a rotary wing aircraft spraying fine droplets close to the upwind edge of a riparian barrier. The fine droplet spray does not simulate the entire droplet spectrum of typical herbicide operations, since typical forestry herbicide application utilizes very coarse droplets, but it does represent the driftable fraction of these applications. The experiment did not include control sprays without barriers because this type of control replicate is confounded by varying meteorology and the complexity of the terrain. A control site with similar transect-terrain geometry but no barrier was not available locally because unbuffered streams of similar size are not allowed by regulation. The study compared the collected deposition data to modeled drift curves generated using the AG-DISP v. 8.21 aerial spray deposition model (Teske et al., 2003). Twenty spray trials were conducted including three blanks. The objective of this work was to examine deposition to a stream within a vegetative barrier and to provide a dataset for future model development.

EXPERIMENTAL METHODS

RELEASE MECHANICS

A Beecomist rotary atomizer (model E360A1, Beecomist Systems, Inc., Telford, Pa.) driven with 28 V (10,000 rpm) and stainless steel 80-100 μm mesh was used to create an ASABE Very Fine to Fine spray drop size distribution (DSD) with $D_{V0.5}$ of 126 μm and relative span ($RS = (D_{V0.9} - D_{V0.1})/D_{V0.5}$) of 1.13 to mimic the fine fraction of the coarser sprays typical of forestry herbicide application. $D_{V0.X}$ is the droplet diameter at which 0.X volume fraction of the spray is comprised of droplets with smaller diameter. This size distribution typically represents the finest 2% to 3% of forestry herbicide sprays. Four atomizers were used, and material was sprayed at a flow rate of 46.8 L ha^{-1} . The distance between the outside nozzles was 5.64 m. The helicopter used was a Bell 47G3-B2A Turbine, and the nozzles were 0.3 m above the bottom of the skids (figs. 1 and 2). The

boom was mounted 2.26 m forward of the mast and 2.5 m below the rotor disk. The aircraft flightline was logged with DGPS. Height was estimated by visual observation as the aircraft passed by the main meteorological tower, which consisted of 3.05 m (10 ft) sections and provided a visual reference. The spray consisted of water with both brilliant sulfoflavine fluorescent dye (BSF) and lithium chloride (LiCl) added as tracers. The results shown here are depositions of BSF tracer dye. The characteristics of BSF are discussed in detail by Zhu et al. (2005).

DROPLET SAMPLING

Four collector types were used. Flat cards mounted horizontally at 1 m height (180 cm^2 , Kromekote, C2S (coated on both sides), 0.015 cm thick) were deployed for near-field deposition sampling. Rotorods were used for fine droplet sampling (U-rods, Surveillance Data, Inc. (SDI), 220 W. Germantown Pike, Plymouth Meeting, Pa.). Artificial foliage (AF), 15.2 cm (6 in.) long, 50 cm^2 projected area, cut from artificial Christmas trees simulating conifer foliage (Shenandoah Pine artificial Christmas tree foliage, Holiday Haus, Woodstock, N.Y.) was used for in-canopy deposition sampling. Samplers were spaced at 8 m intervals along four transects up to and into the riparian barrier with a sampling station placed at mid-stream, a few cm above the water. Volumetric samplers (Mini-Vol, Airmetrics, Eugene, Ore.) pulling air at 7 L min^{-1} through 47 mm filters collecting total suspended particulate were located beyond the barrier to estimate the amount of material that gets past the barrier. The transects were perpendicular to the flight lines, with transects 1 and 2 into the medium stream barrier and transects 3 and 4 into the small stream barrier (fig. 3). Sampler spacing is shown in figure 4. Cards were used primarily in the near field, where drops were larger and card collection efficiencies were higher. Artificial foliage and rotorods were deployed across the edge and inside the barrier. Samples were collected after allowing time for settling of fine particles and wind-driven transport to the farthest collectors. This resulted in 74 samples per test and an experimental total of 1480.



Figure 1. Bell 47G3-B2A Turbine helicopter with four boom-mounted Beecomist rotary atomizers.



Figure 2. Helicopter passing over sampler transects in front of riparian barrier.

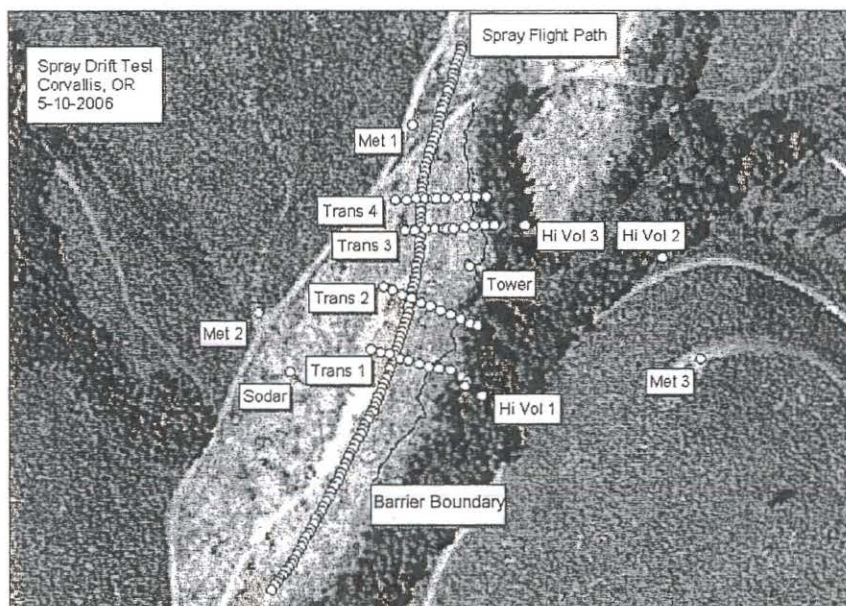


Figure 3. Aerial photo of the field site with sampling points, a typical flight path, and meteorological monitoring stations shown. For scale, transect 1 is 80 m long from beginning to end. The streams are roughly centered within the strip of mature forest, and the ground slopes downward toward the streams and generally downward toward the bottom of the photograph.

Samples were put into coolers and immediately taken to the analytical laboratory. Blank trials were conducted to test for contamination of samples by handling and build-up of tracer on site.

Understanding sampler collection efficiencies (CE) is necessary to understand deposition in a study of this type (Fritz and Hoffmann, 2008; Hewitt et al., 2002). Relative CE measured at the University of Queensland for the droplet size distribution (DSD) used in this study as compared to Douglas fir foliage averaged 0.05 for flat cards over a wind speed range of 2 to 6 m s⁻¹, while the relative CE for the AF collectors was 0.77 over this same range. Relative CE for the roto-

rods was closer to 2.0. Given these collection efficiencies, more emphasis is placed on the AF foliage results in the discussion. However, since deposition measurement with flat cards is still common practice and widely reported, the results for the card transects are also reported for comparison. The rotorod data are not shown here.

ANALYTICAL METHODS

Sample analysis was performed by CH2M Hill (Corvallis, Ore.). Disposable gloves were used to handle samples and disposed of after each trial. Three full blank trials were run exactly simulating the live trials including aircraft flight.

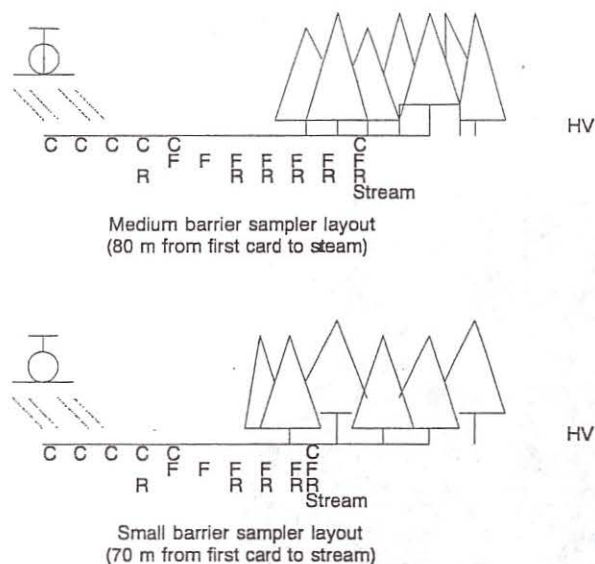


Figure 4. Schematic of the sampling array with C indicating a flat card, F artificial foliage, and R a rotorod. Sampling stations were 8 m apart along the transects. The trees and the HV position are not to scale, and the actual position of the upwind edge of the barrier varied among the transects. Higher brush extends a few meters outward of the trees.

These blank trials indicated minimal site contamination due to tracer build-up as the study progressed. The samples were sealed in glass jars and put on ice and shuttled continuously to the laboratory, where they were received and refrigerated. LiCl and BSF were used as tracers in this study. Due to chemical interference of the artificial foliage collectors in analyzing the LiCl samples, only the BSF samples are discussed here. The analytical method used to determine the amount of deposition of BSF on the samplers is described in detail by Boedinger (2006) and summarized here. This procedure is based on the use of a filter fluorometer. Collectors are rinsed, and the resulting sample is brought to room temperature and, if required, filtered through a glass fiber filter to remove particulate matter. The fluorescence emission energy is measured using the fluorometer. Quantification of dye concentration is achieved by calibration of the fluorometer with freshly prepared dye standards. The excitation and emis-

sion wavelengths are specific to BSF, and the fluorometer lamp and filters must be optimized for the dye used. The fluorometer used was a filter fluorometer (model TD-700, Turner Designs, Sunnyvale, Cal.) with a 10 × 10 mm quartz cell. The reagent water (ASTM Type 1) was deionized, carbon filtered, and free of background fluorescence. The dye was Brilliant Sulfoflavine dry powder (Pfaltz & Bauer, Inc., Waterbury, Conn.), and the dye stock standard of 20 mg L⁻¹ was prepared fresh weekly from neat dry dye powder and stored in the dark. Using this method, the method detection limit (MDL) for BSF was 0.1 µg L⁻¹. Along with complete blank trials, field duplicates were collected. These consisted of two separate samples collected at the same time, placed under identical circumstances, and treated exactly the same throughout field and laboratory procedure. Analyses of duplicates gives a measure of the precision associated with sample collection, preservation, and storage, as well as with laboratory procedures. Laboratory duplicates, laboratory reagent blanks, blank spikes, matrix spikes, and duplicates, as described by Boedinger (2006), were also collected and analyzed to ensure data quality.

RELEASE GEOMETRY AND SITE

The helicopter flew approximately 50 to 60 m upwind of a medium fish-bearing stream buffer and a small fish-bearing stream buffer (as classified in the Oregon Forest Practices Act). The buffers must be at least 15.2 m wide on each side of the small stream and at least 21.3 m on either side of the medium stream. These two buffers will be referred to as small stream barriers (SSB) and medium stream barriers (MSB) in this article. The spray line was flown once for each trial. The pilot attempted to hold a height that was operationally realistic, safe, and constant during the release. Release height and meteorological variables for the trials are shown in table 1. The length of the flight line was dictated by the distance across the four transects into the riparian barrier. The flight-lines extended approximately 300 m prior to and beyond the two outside transects. The selected barriers are typical of riparian barriers in the Pacific Northwest (Ice, 2005). They are reasonably uniform along their length and on the order of 30 to 40 m tall. The barriers consist primarily of Douglas fir (*Pseudotsuga menziesii*) substantially mixed with hardwood undergrowth. The site is adjacent to a newly replanted har-

Table 1. Spray trial environmental and release conditions.

Date	Trial	Time	Release Height (m)	Stability Category	7 m Wind Speed (m s ⁻¹)	7 m T (°C)	7 m RH (%)	Θ _{IM} ^[a] (°)	Θ _{IS} ^[a] (°)
May 10, 2006	3	17:59	15.2	Neutral (4)	1.4	21.4	38	6	50
	4	18:47	15.2	Neutral (4)	1.9	19.4	41	8	32
	5	19:40	15.2	Slightly unstable (3)	1.1	17.7	46	6	58
May 11, 2006	6	7:49	13.7	Neutral (4)	1.6	9.4	70	3	
	7	8:48	13.7	Neutral (4)	2.0	10	68	4	54
	8	9:48	13.7	Neutral (4)	2.0	12	57	8	19
	10	12:10	13.7	Unstable (2)	2.1	17.2	40	18	
	11	13:28	13.7	Neutral (3-4)	3.5	17.7	48	2	24
	12	14:23	13.7	Unstable (2)	2.6	18.2	46	5	31
	13	15:50	13.7	Slightly unstable (3)	2.6	18.8	36	7	27
May 12, 2006	15	7:01	11.4	Strongly stable (6)	.4	1.2	86		
	16	8:08	12.2	Stable (5)	1.0	4.6	84		
	20	19:10	10.7	Slightly unstable (3)	2.2	14.6	42	14	21

^[a] These incidence angles are expressed as off perpendicular where 0° is directly into the edge parallel to the transect. Subscripts M and S indicate medium and small stream transects, respectively.

vested area approximately 50 km W of Corvallis, Oregon, in the Coast Range.

Meteorological sampling was conducted upwind, downwind, and vertically through the riparian barrier. The location of meteorological stations is shown in figure 3. Mean wind vector and turbulence data were collected on the site using three-axis, 15 cm pathlength, Vx probe sonic anemometers (ATI, Longmont, Colo.) collecting data at 10 Hz. The sonic anemometers were deployed at the upwind barrier edge in a profile with one at 2.1 m height (trunk space), one at 12.6 m height (near the vertical canopy density maximum), and one at 27.2 m (near canopy top). Also on the tall tower was a custom-designed temperature profiling system consisting of eight matched thermistors stationed at regular intervals between 2 m and 27 m height. This system is configured as a delta-T profile with delta-T accuracy of 0.05°C (Climatronics Corp., Bohemia, N.Y.). Three 7 m meteorological towers were deployed, and mean meteorological data were collected, including two levels of temperature and humidity (model 41372/43372, R.M. Young, Traverse City, Mich.), wind speed and direction (models 5431, 024, and 010C, MetOne, Grants Pass, Ore.), and net radiation (REBS, Inc., Seattle, Wash.). The wind speeds shown in table 1 are from the 7 m anemometers upwind of the vegetative barrier. Due to the substantial variability in data between the four on-site meteorological towers and to directly match AGDISP input requirements, stability was determined categorically following the established scheme of Pasquill (1974).

A detailed study was conducted the summer after these trials to determine canopy architecture. This study will be reported in detail elsewhere. The technique used was that of a ground-based, scanning LiDAR (Culvenor et al., 2005; Jupp et al., 2009) known as the ECHIDNA system. The three physical principles utilized by this instrumentation are hemispherical scanning, variable beam divergence, and "waveform" sampling of reflected laser energy. ECHIDNA uses a 1064 nm laser pulsed at 2 kHz repetition rate. The system is able to record reflectance as it is generated by each obstacle along the laser path. This measurement of energy intensity as a function of time is known as a "waveform" and the system records this information at one sample every 0.5 ns. Using this method, the plant area index (PAI, m² m⁻²) at this site ranged from 1.1 to 2.1 on the transects inside the canopy, with transects 1 and 3 being closer to a PAI of 1 and transects 2 and 4 closer to a PAI of 2. Note that this type of measurement is difficult near an edge as the edge represents a horizontal discontinuity in PAI, which is defined vertically. These numbers seem reasonable based on similar numbers reported elsewhere (Thistle et al., 2004; Teske and Thistle, 2004) for horizontally more homogenous conifer canopies.

DATA ANALYSIS

To evaluate the effect of the riparian barriers on spray deposition into streams, the AGDISP (version 8.21) spray deposition model was used to generate data representative of spray movement and deposition under similar application scenarios without the influence of the barrier. This model is used by the Canadian Pesticide Management Regulatory Agency (PMRA) to determine spray buffers and is used by the U.S. Environmental Protection Agency (EPA) along with a close derivative model (AgDRIFT) to assess environmental exposure due to pesticide deposition. As mentioned earlier, the difficulties in finding a true control scenario given regulatory

and terrain considerations favored the use of modeling to generate base deposition scenarios for comparison. Since the typical regulatory modeling scenarios are run without considering intervening vegetation to generate conservative cases, the comparison uses accepted modeling to isolate the effects of the barrier and is not influenced by the difficult task of modeling canopy deposition and near- and in-canopy wind fields. The approach chosen is described in detail below and does not rely on absolute deposition but uses deposition at the stream scaled by the transect maximum deposition. In this way, absolute deposition values are not calculated, avoiding a further source of error.

Ratios were calculated for both the card total wash-off concentration and artificial foliage (AF) total wash-off concentration. The ratio for the card data (C_R) was calculated as:

$$C_R = C_{80} / C_{\max} \quad (1)$$

and the ratio for the AF (F_R) was calculated as:

$$F_R = F_{80} / F_{\max} \quad (2)$$

where the subscript "80" denotes the card or AF at the stream (i.e., 80 m downwind from the transect upwind endpoint on the medium stream transects. The same ratio is calculated for the small stream transects, but the stream station is 70 m downwind from the transect upwind endpoint). The subscript "max" indicates the maximum value on a given transect. The first AF sampler was 32 m (30 m) downwind of the beginning of the medium stream (small stream) transect line, while the first card was at 0 m (fig. 4).

The observed ratios (C_R and F_R) were compared to similar ratios calculated from AGDISP runs for cards (M_{RC}) and AF (M_{RF}). The position of the maximum deposition calculated by the model, $P(M_{\max})$, within the range of the sampling locations (0 to 80 m for medium stream cards, 32 to 80 m for medium stream AF, 0 to 70 m for small stream cards, and 30 to 70 m for small stream AF) was used. To compare to observations over the same distances in relationship to peak sample deposition, the model values were used at the following downwind positions:

$$C_{Mdw} = [P_S - P(C_{\max})] + P(M_{\max}) \quad (3)$$

where C_{Mdw} is the downwind distance (m) to the stream position relative to the peak deposit for the cards, P_S is the distance to the end of the transect (80 m for the medium stream and 70 m for the small stream), and $P(C_{\max})$ is the downwind position (m) of the card with maximum deposition. The modeled ratio for the card deposition is then the ratio of deposition at the position indicated:

$$M_C = \text{Dep}(C_{Mdw}) / \text{Dep}(M_{\max}) \quad (4)$$

where Dep indicates modeled deposition at the indicated position. The samplers were arrayed so that the near-field samplers were primarily cards and the sampler type shifted to the AF samplers with distance. This led to a different relationship to determine the model distances to determine the ratio with the AF samplers:

$$F_{Mdw} = [P(F_{\max}) - P(C_{\max})] + P(M_{\max}) \quad (5)$$

and

$$M_F = \text{Dep}(F_{Mdw}) / \text{Dep}(P(M_{\max})) \quad (6)$$

where F_{Mdw} is the downwind distance (m) to the stream position relative to the modeled peak deposit for the cards.

A final adjustment was made to the distances that primarily affected the SSB analyses. AGDISP was originally designed as a 2-D model considering winds perpendicular to a long line source. Recent work has shown that the algorithm can be configured to be used in off-perpendicular winds (i.e., winds not parallel to the transects; Schou et al., 2009), but for these tests it was decided to run the model as perpendicular and adjust the distances (C_{Mdw} and F_{Mdw}) for off-perpendicular winds. Eleven trials were evaluated as above, two stable cases are discussed separately, and four of the trials were not considered because the winds were not within a cone of acceptance of 45° for either the MSB or SSB transects. Wind directions were evaluated at the two upwind meteorological towers (fig. 3). For the MSB transects, of the eleven trials, all were within 18° of perpendicular and nine were within 8° . The fly - no fly decision was based on the wind direction relative to the MSB transects. Therefore, the SSB transects had a lower acceptance rate, as only five trials fell within the 45° cone of acceptance. The adjustment is $1/\cos\theta$ and results in less than a 5% adjustment in distance for all the MSB transects but ranged up to a 18% adjustment in distance for the SSB transects.

Trial parameters used in the modeling are shown in table 1. The results based on table 1 inputs and the actual DSD are termed "realistic." Since the results will be used in the protection of water quality, it was decided to do a second set of modeling with the DSD shifted up by $25\ \mu\text{m}$. By increasing the near-field deposition, the ratio of peak to stream deposition should go down and the indicated effect of the barrier should be decreased. There are three primary reasons for doing this. First, some larger drops were observed on cards in the field, and it is likely that fine spray was collecting and dripping from the helicopter skids. A few of these very big drops could increase the actual DSD, thus increasing observed deposition near the flight path. This would not be picked up in the wind tunnel DSD evaluation. Secondly, AGDISP/AgDRIFT has shown some tendency to underpredict near the block edge (Bird et al., 2002; Hewitt et al., 2002; Thistle et al., 2008). This tendency could overstate the role of the barrier in this analysis. Finally, the design of AGDISP and AgDRIFT has been guided by many entities, including the U.S. Environmental Protection Agency, and is somewhat conservative, providing a safety factor for regulatory decisions. When used in the relative way reported here, considering peak to point ratios, it is not clear that this conservatism is maintained. Since water quality concerns require conservative assumptions, it was thought reasonable to provide these based on calculated results. Thus, the results labeled "conservative" are an approach to alleviating potential experimental and modeling errors while providing a rational, conservative case to be used in environmental evaluation.

The model was run for the specific scenarios represented by the individual trials. Since the desired information is relative loss over a specified distance, a unit emission modeling approach was used. The material was modeled as having 0.1 non-volatile fraction, which is probably higher than that of the actual tank mix but is viewed as conservative in this exercise, as lowering evaporation will increase droplet size and lower the effect of the edge when compared to data. In interpreting the results, an M_C value of 0.1 indicates that deposition at 80 m along the modeled transect is 10% of the maximum deposition on the transect for a given modeled scenario. A C_R value of 0.02 for the same scenario indicates that

the barrier reduced deposition by 80% $[(1 - (0.02/0.1)) \times 100]$. Quality control measures both in the field and in the laboratory indicated that the data set was of high quality; the blank trials showed little sample contamination due to either site contamination or handling. Of over 1400 tracer samples, only two were identified as problematic.

The card at the small stream sampling station in trial 8 showed unreasonably high deposition, which was not corroborated by collocated samplers or nearby sampling stations. This card was eliminated from the analysis. More problematic is the high outlier stream station on transect 2 in trial 12. This sample was over three times higher than the next highest sample and ten times higher than the mean. However, this sample was corroborated by collocated samplers and to some degree by nearby samplers. It is suspected that contamination was caused by contaminated handling common to all the samplers at the station, so these high values remain suspicious. It has been decided to show the results with the transect 2, trial 12 data included parenthetically in the summary statistics and to include this data in the histograms, where the ratio using this value shows up graphically as a strong outlier. Finally, the SSB transects for trial 20 met the criteria for the wind direction acceptance angle, but the wind direction was spatially highly variable across the three on-site meteorological stations used to determine wind direction during this trial. Video footage indicated that the spray did not move parallel to the SSB transect in trial 20, so transects 3 and 4 were eliminated for that trial. As noted earlier, because the SSB and MSB transects did not have the same orientation to the edge, both transects did not always meet the acceptance criteria. This resulted in 22 MSB transects analyzed below as compared to 10 SSB transects.

It is recognized that in using this relative ratio approach, collection efficiencies for the samplers are assumed to be constant along the transect. Collection efficiencies are strongly dependent on droplet size for horizontal cards. Since the DSD is expected to shift towards finer droplets downwind from the maximum deposition, it is expected that the collection efficiency of the cards will decrease with distance downwind, based on wind tunnel measurements. Collection efficiency of the AF is less affected by droplet size, as determined by wind tunnel testing. In this analysis, such changes in CE could increase the difference between peak deposition and deposition at the stream and could be incorrectly interpreted as canopy influence. This does not appear to be a strong effect in these data, but it is noted.

The discussion of results is divided into a summary of the trials that ranged from unstable (2) to neutral (4) stability and a separate discussion regarding the two stable (5 to 6) trials. This division was necessary due to the very low wind speeds and high variability of wind direction leading to a poorly defined "average" direction in the stable trials. These factors make the stable cases poor candidates for the type of modeling used here. However, since the stable cases are viewed as important scenarios from the standpoint of fine droplet drift and are typically characterized by the conditions encountered in these tests, it was considered important to discuss these two trials in some detail.

RESULTS AND DISCUSSION

A summary of the trial results (excluding the two stable trials) is shown in tables 2 and 3. It is evident that the riparian

Table 2. Ratios for medium stream transects.

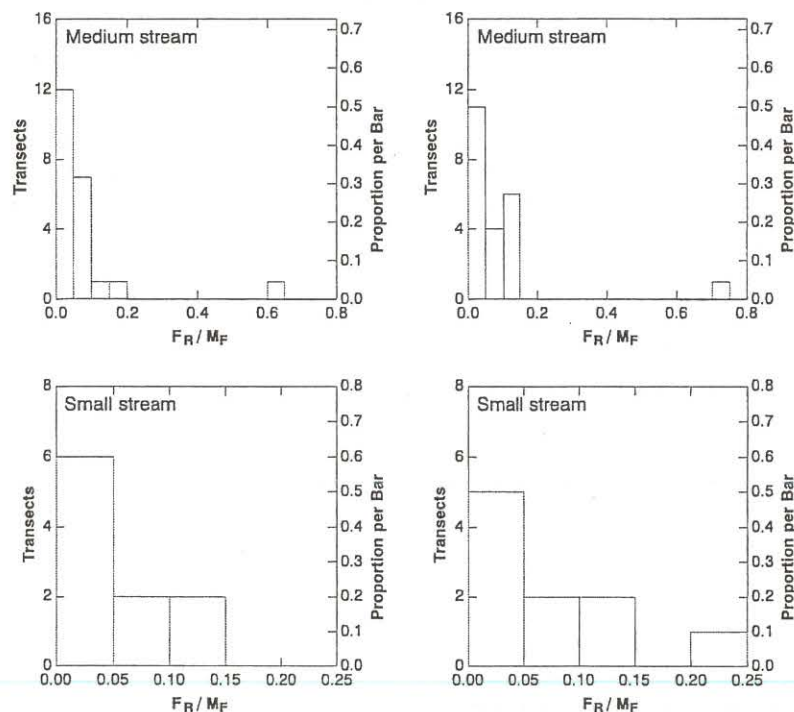
Trial	Transect	Realistic Scenario		Conservative Scenario	
		Card	AF	Card	AF
		Deposition (C_R/M_C)	Deposition (F_R/M_F)	Deposition (C_R/M_C)	Deposition (F_R/M_F)
3	1	0.012	0.062	0.001	0.024
	2	0.146	0.152	0.09	0.059
4	1	0.036	0.022	0.121	0.022
	2	0.039	0.036	0.115	0.068
5	1	0.021	0.037	0.039	0.135
	2	0.03	0.06	0.052	0.028
6	1	0.006	0.034	0.01	0.047
	2	0.017	0.03	0.03	0.041
7	1	0.011	0.094	0.036	0.136
	2	0.068	0.071	0.214	0.147
8	1	0.011	0.094	0.036	0.136
	2	0.068	0.071	0.214	0.147
10	1	0.036	0.03	0.062	0.036
	2	0.007	0.06	0.011	0.073
11	1	0.023	0.009	0.029	0.01
	2	0.022	0.041	0.026	0.044
12	1	0.014	0.049	0.017	0.054
	2	1.087	0.628	1.474	0.723
13	1	0.297	0.028	0.322	0.027
	2	0.036	0.131	0.039	0.127
20	1	0.023	0.011	0.043	0.015
	2	0.012	0.007	0.021	0.01
Mean		0.04 (0.09)	0.05 (0.08)	0.07 (0.14)	0.07 (0.10)
SD		0.07 (0.23)	0.04 (0.13)	0.08 (0.31)	0.05 (0.15)

barrier greatly influenced the amount of spray reaching the stream surface. The mean ratios for the MSB realistic scenarios are 0.04 with SD of 0.07 for the card data and 0.05 with

Table 3. Ratios for small stream transects.

Trial	Transect	Realistic Scenario		Conservative Scenario	
		Card	AF	Card	AF
		Deposition (C_R/M_C)	Deposition (F_R/M_F)	Deposition (C_R/M_C)	Deposition (F_R/M_F)
4	1	0.037	0.022	0.111	0.079
	2	0.112	0.129	0.364	0.204
8	1		0.009		0.015
	2	0.097	0.027	0.146	0.033
11	1	0.065	0.13	0.075	0.143
	2	0.34	0.095	0.381	0.1
12	1	0.026	0.02	0.04	0.023
	2	0.003	0.071	0.008	0.078
13	1	0.176	0.025	0.163	0.024
	2	0.027	0.023	0.052	0.022
Mean		0.10	0.06	0.15	0.07
SD		0.11	0.05	0.14	0.06

SD of 0.04 for the AF data. Without considering the outlier (transect 2, trial 12), the results range from <1% of modeled without a barrier present for both the cards and AF to 30% for the cards and 15% for the AF for the realistic cases. Note that it was expected that the results would be higher for the AF as it is compared over a shorter distance, since the maximum AF sampler was not expected to sample the peak deposition. Considering the position of the AF samplers (fig. 4), these samplers may more directly indicate the drop across the barrier edge caused by foliar capture. On the other hand, they may not reflect some of the stream protection afforded by the barrier due to deflection of the streamlines over the barrier. As expected, the conservative case causes a shift to higher stream deposition, although it is not substantial as the values only increase by 2% and 3%, respectively, for the cards and AF. It is clear that the riparian barriers can be expected to

Figure 5. Histograms showing F_R / M_F for the two barrier scenarios: realistic cases are on the left, and conservative cases are on the right.

capture or deflect over 90% of spray from the streams within the barrier.

It is expected that the SSB would capture less material than the MSB, but that is only weakly indicated in these data, as the mean increases by 6% and 1% for the cards and AF, respectively. It must be remembered that the trajectory corrections based on wind direction were larger (table 1) for the SSB data, ranging between 6% and 18%, while the MSB corrections ranged between 0% and 5%. This means that the spray had a longer transport trajectory both in reaching the edge and through the barrier than the SSB width indicates. This would allow both for more encounters with possible collecting surfaces as well as more time to deposit before reaching the stream.

The distribution diagrams (fig. 5) of all tests including the MSB outlier show that for the larger MSB dataset, 19 of 22 tests show 90% reduction or better for the realistic case, and 15 of 22 for the conservative case. For the SSB, 8 of 10 show 90% reduction or better for the realistic test, and 7 of 10 for the conservative test.

The existence of a few trials that show higher values is of interest. The model considers environmental, mechanical, and operational parameters, so covariance between the ratios presented here and the variables that influence drift has largely been removed. A suspect in the variability seen in these data, although relatively low in general, is the variability in canopy density. The edge is not uniform, and the stems and underbrush are thicker in some places than others. The aggregate measurements discussed earlier capture some of this variability, but the combination of turbulent airflow near the barrier and variation in the distribution of the canopy might allow droplets to occasionally land at the stream sampling stations based on unique combinations of the flow field and aircraft passage. The fact that the method yields reasonably consistent results is remarkable in the face of the complexity of the near-barrier flow field, given both the non-uniform density of the vegetative barrier and the complex terrain. Transect 2 of trial 12 may be a simple case of contamination, as discussed earlier, but it may also point up the variability inherent in this highly turbulent scenario with intermittent airflow and non-uniform canopy distribution. This is to say that the airborne spray droplets in a denser group may occasionally find less obstructed pathways to the stream, although the data indicate that this is at best occasional.

It is of interest to consider how these results translate back to application practice. It must first be reemphasized that conscientious aerial applicators would not spray this close to the riparian barrier with winds consistently toward the edge, and certainly would not select for winds directly into the barrier towards the stream. Acknowledging this, about 2.5% of an ASABE Very Coarse spray ($D_{V0.5} = 478 \mu\text{m}$) that might be the DSD typically used in forest herbicide operations is in droplet sizes less than the $D_{V0.5}$ used in these tests. It is not clear exactly what the currently mandated barrier widths are based upon, but with reasonable applicator diligence, direct herbicide deposition to streams within the barrier will be very low.

As an exercise to evaluate the effect of the results here on modeled stream buffers, trial 11 was modeled with AGDISP 8.21 using an ASABE Very Coarse DSD and assuming the wind directly into the riparian barrier. The percentage of application rate at 60 m is 0.014 and 0.0014 without and with the barrier present, respectively. The corresponding numbers

for 120 and 240 m are 0.0018, 0.00018, 0.00084, and 0.000084, respectively, all assuming that 90% of the material is captured by the barrier. The difference at 60 m with and without the barrier corresponds to a difference of around 67 m using the trial 11 scenario (meaning the stream inside the barrier would receive similar deposition to a stream 67 m farther downwind with no vegetative barrier present). The difference considering a stream at 120 m is over 600 m. The order of magnitude difference in the two distance numbers reflects the exponentially decreasing deposition curve with downwind distance.

STABLE TRIALS

The two stable trials (trials 15 and 16) are treated separately because they are not appropriate candidates for modeling. These two trials were conducted earlier in the morning of May 12. The evolution of the near-surface temperature profile is shown in figure 6. It is seen that a cold morning with an inverted temperature profile rapidly warmed as the surface heated. Table 1 indicates that the wind speeds were very low for morning trials 15 and 16. As mentioned earlier, the lack of a reasonably steady wind direction, as evidenced both by meteorological observations and visually when studying the video recordings of these tests, precluded use of the AGDISP model for comparison. Stable atmospheres are of great interest in the study of drift as they allow for fine droplets to remain concentrated, airborne, and available for drift. However, the very low wind speeds typical of these conditions mean that lateral drift is low, so even very fine droplets with low settling velocities will tend to remain near the target. The various considerations are the subject of a previous review (Thistle, 2000). The highly variable wind directions and often transient nature of stable conditions, combined with the fact that for many applications only a small fraction of the total spray mass is comprised of fine droplets and is susceptible to remaining airborne at low wind speeds, makes this phenomenon difficult to study and the data collected in stable atmospheres hard to obtain and valuable.

The stream to peak depositions are very low for the stable trials, indicating little wind-driven drift. This reflects the lack of higher wind speeds commonly associated with larger droplet drift. However, the fact that the wind direction was not consistently toward the edge in these trials makes the deposition data difficult to interpret. It is expected that fine droplets with low settling velocities will remain airborne and stay to-

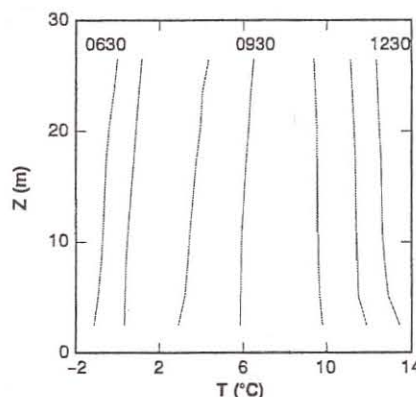


Figure 6. Temperature profiles as they evolved from 0630 (left) at hourly intervals to 1230 (right) through the morning of May 12.

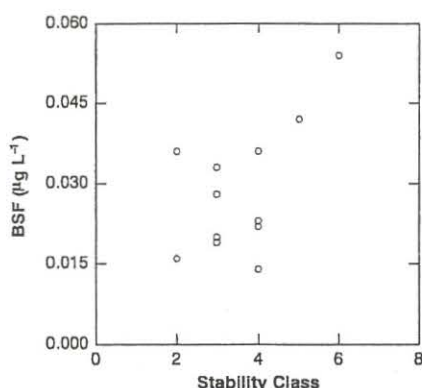


Figure 7. Average BSF concentration at suction samplers downwind of the riparian barrier vs. stability class as shown in table 1.

gether as mixing of the air layer is suppressed. Figure 7 shows the average data from the Mini-Vol volumetric samplers (labeled "Hi Vol 1 and 3" in fig. 3) positioned beyond the transects across (downwind) of the riparian barriers versus the stability for these trials. This data set, although limited, shows the stable trials (stability categories 5 and 6) with higher trial-integrated mass at these samplers. Although the numbers are small in an absolute sense, this data set illustrates the point that the fine droplets can remain airborne in stable conditions, which are characterized by low wind speed and low mixing. Similar results were shown by Miller et al. (2000) near an orchard after spraying during stable conditions.

CONCLUSIONS

This study demonstrates that riparian barriers prevent a substantial portion of airborne droplets from depositing into streams. The complexity of the terrain and the obstructions to airflow presented by the edges of the vegetative barriers combine to create a complicated and turbulent scenario for the flow of air near the barriers. Theory suggests that vertical deflection of the airflow carrying small droplets, a lower air velocity region immediately upwind of the barrier, and the foliar, stem, and bole surfaces themselves all combine to reduce deposition to the in-barrier stream.

The complicated question of droplet drift in stable atmospheres cannot be definitively addressed by these trials, but there is evidence of increased suspended droplet drift, although the absolute mass of drift is very low in the stable trials due to very low wind speeds.

Focusing on the AF collectors and the MSB transects, the average ratio of deposition to a stream in a barrier to that with no barrier was 0.05 (SD 0.08) and 0.07 (SD 0.10) for the realistic and conservative cases, respectively. Modeling indicates that the differences observed here result in much longer distances to a specific point deposition when the buffer is present. This would require a shorter no-spray buffer if the calculation is based on a specific deposition to a stream deemed to be a toxicological threshold for in-stream concentration and corresponding biological effects. Future work will focus on using the data collected in this study combined with published theory to build a mechanistic model of droplet capture by vegetative barriers.

ACKNOWLEDGEMENTS

We would like to acknowledge the fine work of the helicopter pilot, Mr. John Mateski of Western Helicopter Services, Inc., and the Corvallis office of CH2M Hill for sample analysis. Weyerhaeuser, Inc., graciously allowed us access to managed forest lands to perform this study. We would also like to acknowledge the design and organizational contributions and the field work of Gary Kees, Wes Throop, Mike Huey, Scott Gilmour, and Jim Kautz of the USDA Forest Service, Missoula Technology and Development Center. Funding was provided by the USDA Forest Service, the National Council for Air and Stream Improvement, Inc., and Crop Life America.

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mini-inversion under
trees

Factors Affecting Drift
Spray characteristics
chemical

can't generally see
smaller than 150

VMD
volume median diameter
 $\frac{1}{2}$ spray volume = smaller droplet

Relative Spray Goal

Drift Reduction Additives
Deposition aids

DRT


June 16, 2010

Western Lane Tour


1000-	Introductions History of ODF General overview
1100	Leave for Triangle Lake area
1130	Arrive Fish Creek stops (Weyerhaeuser)
1230	Lunch (Bring your own)
1300	Arrive (Seneca)
1430	Arrive Triangle Lake School

Attendees:

Dale Mitchell	Dave Lorenz
Marganne Allen	Brad Knotts
Link Smith	Paul Clements
Mike Odenthal	Chad Schulze
Erin Halbert	




**The Oregon Department
of Forestry and Forest
Pesticide Use**



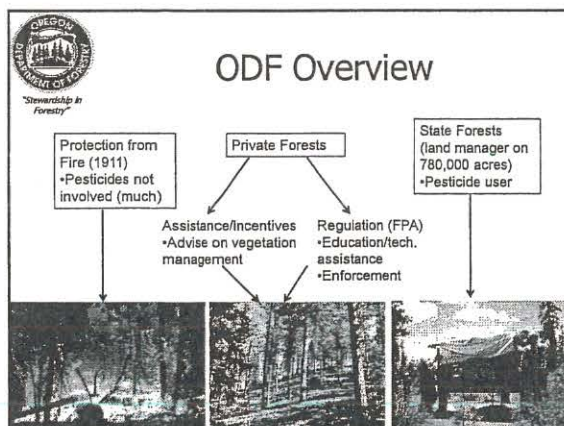
Oregon
Department of
Forestry

June 15, 2010



**ODF and Forest Pesticide
Use**

- Presentation Outline
 - ODF overview
 - Forestry Assistance
 - Forest Practices
 - Working together





Private Forests

- Forestry Assistance (ORS 526.425-526.515)
 - Assist forest landowners; work with other agencies
- Oregon Forest Practices Act (ORS 527.630(1))
 - Economically efficient forest practices
 - Continuous growing/harvesting of forest trees
 - Protect soil, air, water, and fish and wildlife.

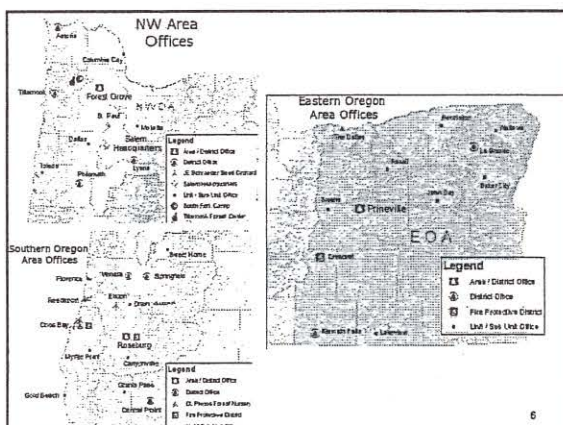
4



ODF Field/Staff Administration

- Administered by ODF
- Decentralized field organization; 20+ offices throughout the state; 20-30 field foresters
 - Multiple funding sources
- Support from line organization and Private Forests Program Staff
- 50% + reductions over last two biennia

5



6



Forestry Assistance

- Technical advice
- Administer cost-share/assistance programs
 - 50% tax credit, Forest Resource Trust
 - Federal programs
 - CREP, EQIP, etc.
 - Healthy forest reserve/ESA safe harbor
 - Forest health/fire resistance
- Recommendations may involve herbicide use

7



Forest Practices Act: Jurisdiction (location)

- On "forest land"
(ORS 527.620(7))



- Wherever forest trees are grown and harvested
- Without regard to zoning or tax status





Forest Practices Act Jurisdiction (activity)

- On "operations" (OAR 629-600-0100(47))
 - Anything related to commercial growing and harvesting forest trees
 - Harvesting, road construction, slash treatment, etc.—includes forest pesticide/fertilizer use.
 - Exceptions: Christmas trees, hybrid poplar < 12 years, some cities.

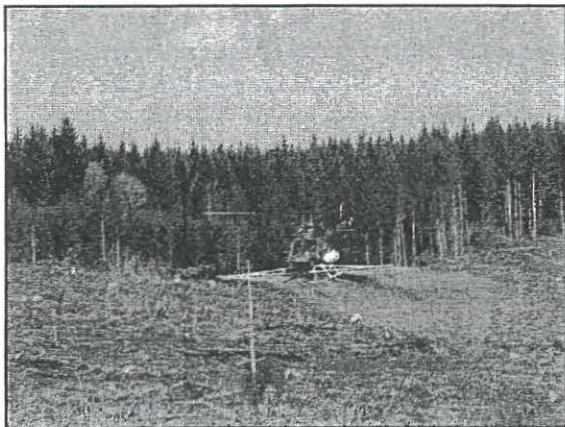
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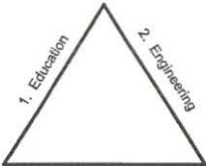






**Forest Practices Act
Administration**

- First Steps:
Education +
Technical Design—
that usually works
- If not, enforcement
is needed
 - Warning citation,
civil penalties



3. Enforcement

(OAR 629-670-0015)



Forest Practices Act: Notification

- Required for chemical applications as for other "operations"
- 155-day waiting period
- Pesticides:
 - Brand or common name, application type, additives
 - For 2,4-D and triclopyr, specify amine or ester
 - ODF to maintain public access application rates (via label page)
- Fertilizers application rate

16



Forest Practices Act: Notification

- Notification data public, fee-based subscription
- No-fee subscription for surface water use right 10 miles downstream of application (ORS 527.670(6))
- ~~Applicator~~ must notify community water system manager for applications within 100 feet (air) 50 feet (ground) of Type D or F with domestic use
 - ODF has applicable CWS list


17



Forest Practices Act Chemical Rules

- "Chemicals"
 - Pesticides (ORS 634.006(8))
 - Additives
 - Petroleum-based carriers
 - Fertilizers (ORS 633.311)

18



Forest Practices Act Chemical Rules

■ Context

- FPA Chemical Rules
 - OAR 629-620
- FPA veg. retention rules
- Product label
- ODA pesticide statutes and rules
- DEQ spill regulations

■ Purpose

- Pesticides are useful tools if used properly
- Protect retained vegetation, water quality, fish and wildlife by:
- Keeping "injurious" quantities from soil, air, water

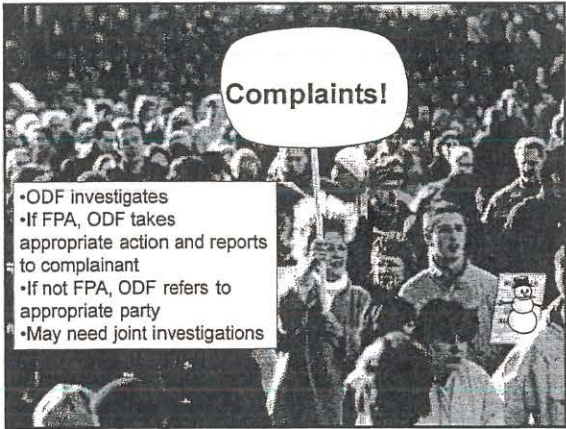
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Forest Practices Act Chemical Rules

- Prevent, stop, control, contain, report, cleanup spills
 - DEQ has primary authority for spill cleanup
- Protect waters of the state
 - No direct application buffers along fish streams, domestic use streams, large wetlands, open waters > 1/4 acre
- Retain vegetation required to be left after logging (e.g., stream buffers)
- Daily application records (similar to ODA)

20



Complaints!

- ODF investigates
- If FPA, ODF takes appropriate action and reports to complainant
- If not FPA, ODF refers to appropriate party
- May need joint investigations



Working with ODA

- ~~Shared regulation~~ of forest pesticide use
- ~~1995~~ MOA
 - Work together: ODA focus on label, licensing, off-site damage; ODF focus on natural resources on forest operations.
 - ODA leads for label issues
 - Consistent rule development
 - ODF leads forest operation inspections
 - Coordinate sampling, analysis
 - Joint investigation/enforcement, as appropriate
 - Training of applicators/landowners
- ~~Work together~~ and share information!

22



Working with ODA

- 2009: ODF lost pesticide-specific position
- Contacts:
 - Pesticide policy issues: Marganne Allen
 - General forest pesticide contact: Brad Knotts
 - Specific operations: Brad Knotts, who will refer to field office, or direct contact to field office
 - Field office contact information at <http://www.oregon.gov/ODF/>.
- Pesticide Analytical Response Center

23



ODF Notification Website

<http://www.oregon.gov/ODF/privateforests/fpaNotifications.shtml>

Notification of Operation/Application for Permit

<http://www.oregon.gov/ODF/privateforests/docs/NotifFormLtr.pdf?ga=t>

<http://www.oregon.gov/ODF/privateforests/docs/NotifFormLgl.pdf>

Instructions for Filling out the Notification

<http://www.oregon.gov/ODF/privateforests/docs/NotifFormInstructionsLgl.pdf>

How to Become a Subscriber

<http://www.oregon.gov/ODF/privateforests/docs/FACTS/SubscriberApplication.pdf>



NOTIFICATION OF OPERATION/APPLICATION FOR PERMIT

OREGON DEPARTMENT OF FORESTRY

OREGON DEPARTMENT OF REVENUE



Filing this notification does not grant permission to remove forest products! You must have permission from the landowner and timber owner.

The landowner is responsible for reforestation. Early consultation with the Stewardship Forester is advised.

For activities or operations changing the land to a non-forest use, the applicant is advised to contact the appropriate local government regarding land use regulations which may apply to the future use or development of this site.

On-site inspections may be conducted by Oregon Department of Forestry (ODF) employees to ensure compliance with all the laws and rules governing fire protection and forest practices on private land.

File a new Notification of Operation/Application for Permit form at an ODF office if **any** of the following conditions apply:

- Your operation area is new.
- You are adding a new activity to the operation.
- You are changing or increasing the area involved in an existing operation.
- It is after February 28, and you are continuing an operation that has been idle since the end of the previous calendar year and you have not informed ODF you intend to continue the operation before now.

ODF must also be informed in writing of any other changes in the information on an existing notification, but completion of a new form may not be required.

Provide PHOTOCOPIES of the completed original notification form and map to the local offices of the Water Resources Department and the Oregon Department of Fish and Wildlife ONLY IF you plan to use on-site water to mix pesticides or to control slash burns.

Multiple harvest units may be listed on one notification. BUT, if HARVEST units are separated by a mile or more (in a straight line) or are in different counties, file separate notifications for each unit. An operation can be any combination of forest activities. See OAR 629-605-0140 for a complete list. OAR 629-600-0100 defines "operation," "commercial," and "unit."

The instructions are printed in italics. Please print or type the information on the form.

Do not fill in green boxes.

File notice with the State Forester at least 15 days prior to the date you would like to start operating. A notification is not considered accepted until it is properly filled out, has a map attached, and is received by the appropriate ODF office. Mail, fax, or deliver the form to one of the Oregon Department of Forestry offices that accepts notifications.

COUNTY (Enter only one):		NOTIFICATION NUMBER (Office Use)	
NOTICE & PERMIT TYPE Check box(es) that apply	<input type="checkbox"/> 2A Notice to the State Forester that an operation will be conducted on lands described here (ORS 527.670). 15 day waiting period required, unless waived.	DATE RECEIVED: _____	
	<input type="checkbox"/> 2B Application for permit to operate power driven machinery (ORS 477.625). Expires at end of operation.	TIME RECEIVED: _____ INITIALS: _____	
	<input type="checkbox"/> 2C Notice to the State Forester and the Dept. of Revenue of the intent to harvest timber (ORS 321.550).	DISTRICT: _____	
Enter name & phone number of person to be contacted in case of fire emergency. This person should know what resources they have available for fire and have the authority to commit these resources in case of fire.		OFFICE: _____	
REPRESENTATIVE: _____		DATE OF CORRECTION: _____	
AREA CODE: _____ PHONE NUMBER: _____		CORRECTION: _____	
Check the appropriate box as to who is completing this form:			
<input type="checkbox"/> Operator <input type="checkbox"/> Landowner <input type="checkbox"/> Timber Owner			
TIMBER SALE NAME AND/OR NUMBER (If applicable):			
Enter the Operator information			
OPERATOR (Person and/or company conducting the operation)	Name: _____		
	Business Name: _____		
	Mailing Address: _____		
	City, State, & Zip Code: _____		
	Area Code: _____ Phone No.: _____		
Operator Codes: UDF1: _____ UDF2: _____ UDF3: _____ UDF4: _____ UDF5: _____			
ATTENTION: If you are conducting timber harvesting or road construction within 100 feet of overhead or underground utility lines, call the Oregon Utility Notification Center at 1-800-332-2344. Request that the owner of the line be notified, and record the number issued to you by the Oregon Utility Notification Center here: _____			

LANDOWNER**RC/EG/S Codes**

Information about the forest landowner in Recipient Class (RC), Ethnic Group (EG), and Land Ownership Size (S) is needed for annual reports. We ask you to voluntarily enter this information.

RC: (Recipient Class) Check the box that best identifies the landowner:

- ☐ 1. Local Government
☐ 2. State Government
☐ 3. Federal Agency
☐ 4. Individual/Non-industrial private
☐ 5. Partnership/Corporation/Industrial
☐ 6. Other private (church, nonprofit organization, etc.)

E.G. (Ethnic Group) Check the box that best identifies the landowner (Codes 2-7 apply to recipient class 4 [individual] only):

- ☐ 1. Does not apply
☐ 2. White
☐ 3. Black
☐ 4. Hispanic
☐ 5. American Indian/Alaskan Native
☐ 6. Asian/Pacific Islander
☐ 7. All other

S: (Land Ownership Size) Check the box that best identifies the total forest ownership of the landowner:

- ☐ 1. Does not apply
☐ 2. 0 - 9 acres
☐ 3. 10 - 99 acres
☐ 4. 100 - 499 acres
☐ 5. 500 - 999 acres
☐ 6. 1,000 - 4,999 acres
☐ 7. 5,000 + acres

(Landowner is responsible for reforestation)

Name:

Business Name:

Mailing Address:

City, State, & Zip Code:

Area Code:

Phone No.:

ATTENTION: Timber harvesting may result in a tree planting requirement on the landowner. The landowner has the responsibility to reforest if the harvest results in an under stocked condition.

Landowner Codes: UDF1: UDF2: UDF3: UDF4: UDF5:

Enter the Timber Owner and Taxpayer Information

TIMBER OWNER AND TAXPAYER

(Responsible for paying the harvest and, if applicable, severance taxes)

Name:

Business Name:

Mailing Address:

City, State, & Zip Code:

Area Code:

Phone No.:

ATTENTION: You are required to provide a Timber Owner Employer Identification Number OR a Social Security Number by the Oregon Department of Revenue's Statute ORS 321.015. **The Social Security Number will be used ONLY for the purpose of identifying you to the Dept. of Revenue for the collection of timber tax.** The Social Security number will be held in confidence.

Enter the Timber Owner Employer Identification No. OR a Social Security No. in the box:

Timber Owner Codes: UDF1: UDF2: UDF3: UDF4: UDF5:

(Continued on Next Page)

UNIT NO. _____

SF#: _____

Fire priority: _____

FPA priority: _____

Page 3

Enter Unit No. If more than one unit, use Unit Addendum Sheets.
Check appropriate box(es) & fill in acres/feet/etc.

ACTIVITY CODE

- ☐ **1A** COMMERCIAL THINNING,
SELECTIVE CUTTING
(leaving most of the
merchantable timber on the
unit after harvesting)
_____ Acres

METHODS USED

- ☐ Cable
☐ Ground
☐ Other (explain) _____

ESTIMATED MBF REMOVED: _____

- ☐ **1B** CLEAR-CUT, OVERSTORY
REMOVAL (most or all of
the merchantable timber
will be removed during
harvesting)
_____ Acres

- ☐ Cable
☐ Ground
☐ Other (explain) _____

ESTIMATED MBF REMOVED: _____

- ☐ **1C** FELLING only
_____ Acres

- ☐ **1D** OTHER HARVEST TYPES
not covered in **1A** or **1B**
(wind storm salvage,
hauling r/w logs, selling
chips, etc.)
_____ Acres

Explain on lines below

ESTIMATED MBF REMOVED: _____

- ☐ **1E** SORT YARD

- ☐ **2A** ROAD CONSTRUCTION (NEW)

_____ Feet
_____ Est MBF

- ☐ Dozer
☐ Backhoe
☐ Other (explain) _____

- ☐ **2B** ROAD RECONSTRUCTION
(EXISTING)

_____ Feet
_____ Est MBF

- ☐ Dozer
☐ Backhoe
☐ Other (explain) _____

- ☐ **3** SITE PREPARATION
(REFORESTATION) (Do not
use for building construction
site)
_____ Acres

- ☐ Manual
☐ Mechanical
☐ Burning

CAUTION: Fill out **Methods Used** for each type of chemical application.

- ☐ **4A** HERBICIDE application
_____ Acres

- ☐ Aerial
☐ Ground

- ☐ **4B** INSECTICIDE application
_____ Acres

- ☐ Pressurized &
Broadcast
☐ Other methods

- ☐ **4C** RODENTICIDE application
_____ Acres

Write in common name, brand
name (if known), carrier,
additives, or, for fertilizer only,
the application rate. For
triclopyr and 2,4-D only,
specify whether amine or
ester formulation: _____

- ☐ **4D** FERTILIZER application
_____ Acres

- ☐ **4E** FUNGICIDE application
_____ Acres

- ☐ **4F** REPELLENT application
_____ Acres

(Continued on Next Column)

Check appropriate box(es) & fill in acres, etc.

ACTIVITY CODE

- ☐ **5** CHANGING LAND USE
to a non-forest use (house
site, agricultural, etc.)
_____ Acres

- ☐ **6** TREATMENT OF
SLASH
_____ Acres

- ☐ **7** PRE-COMMERCIAL
THINNING
_____ Acres

- ☐ **8** OTHER Explain on line below

METHODS USED

WARNING: Local government
land use approval may be
required. A land use change
may not exempt the landowner
from all reforestation
requirements.

- ☐ Manual
☐ Burning
☐ Mechanical

Enter starting and ending dates.

ESTIMATED STARTING DATE: _____

(Must be 15 days after the appropriate office receives notification)

ESTIMATED ENDING DATE: _____

(Continuation into next calendar year requires written notice to the local ODF office)

SITE CODES

Check the appropriate Waters, Topography, and Soil site codes.
One of each code must be checked on each unit.

WATERS

- ☐ **W100** Within 100' of any lake or stream, (a channel that carries
flowing surface water during some time of the year)
☐ **W300** Within 300' of any estuary or any wetland greater than 8 acres
☐ **WNA** Waters not present in operation area

TOPOGRAPHY (over the steepest third of operation)

- ☐ **T1** Slope of 0% to 35%
☐ **T2** Slope of 36% to 65%
☐ **T3** Slope greater than 65%

SOIL

- ☐ **S1** No evidence of mass soil movement (slips, landslides, etc.)
☐ **S2** Evidence of old slides, small failures
☐ **S3** Recent or active movement; wet areas

APPLICANT REMARKS: Please describe the intent of the operation,
what equipment will be used and any other information that may be
relevant to the Stewardship Forester.

(Continued on Next Page)

CONCERNSCheck any **Concerns** that you are aware of in the boxes below.

- ☐ **ARC** Archaeological site
- ☐ **CGG** Columbia Gorge General management area
- ☐ **CGS** Columbia Gorge Scenic management area
- ☐ **SH** Scenic Highway (operation near a FPA scenic highway)
- ☐ **SW** Operation near a state Scenic Waterway
- ☐ **UGB** Operation takes place within an Urban Growth Boundary
- ☐ **WG** Operation takes place in the Willamette Greenway

STREAM NAME and/or SIZE, TYPE, & WATERSHED CODE**WATERS**Check any of the **Water** codes that you are aware of in the boxes below.

- ☐ **DWS** Domestic Water Supply
- ☐ **LL** Lake greater than 8 acres
- ☐ **OTHER LAKES** Less than 8 acres
- ☐ **OTHER WETLANDS** Less than 8 acres
- ☐ **WETLANDS** Bog, estuary, significant wetland (>8 acres), important springs in E. Oregon

(Continue to Next Column)

RESOURCESCheck any of the **Resources** that you are aware of in the boxes below.

- ☐ **BEN** Bald Eagle Nesting site
- ☐ **BEP** Bald Eagle Perch and foraging site
- ☐ **BER** Bald Eagle Roosting site
- ☐ **BIO** Biological site of a rare life form or community
- ☐ **BPS** Band-tailed Pigeon mineral, watering, or springs site
- ☐ **CC** Operation will result in a single clear-cut or continuation of contiguous clear-cuts that exceed 120 acres
- ☐ **CWD** Columbia Whitetail Deer
- ☐ **GBH** Great Blue Heron nest site
- ☐ **GLD** Golden eagle nest site
- ☐ **HLH** High Landslide Hazard Location
- ☐ **MUR** Marbled Murrelet nest site
- ☐ **NSO** Northern Spotted Owl site
- ☐ **OSP** Osprey nest site
- ☐ **RAP** Other Raptor nest site
- ☐ **SBS** Sensitive Bird nesting, roosting, or watering site
- ☐ **T&E** Threatened or Endangered species site

(Continue to Legal Description)

Rule: Non stat. WP: Stat. WP: AP: Rule: Non stat. WP: Stat. WP: AP:

LEGAL DESCRIPTION

Check each 1/16 of every section that applies. Enter information for government lots (if applicable), section, township, and range.
If more space is needed use a *Legal Description Addendum Sheet*.

Govt. Lot # if outside std section	NE				NW				SW				SE				S E C	T W P	R G E	REGULATED USE AREA
	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE				
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
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	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				

Subscriber:

Subscriber:

W. R. Subscriber:

AAccmp

Subscriber:

Subscriber:

W. R. Subscriber:

There is a 15-day waiting period in effect.

Do not begin operating unless the waiting period has passed or is waived in writing by the Stewardship Forester.

Check this box to request a waiver of the 15-day waiting period. Checking the box does not necessarily mean a waiver will be granted.

☐

Waiting period waived by:

Date:

Print name of applicant in box below.

X

I (applicant) certify that all information I have provided is true & correct.

Signature:

Date:

ATTACH MAP AND/OR AERIAL PHOTOS (The notification form is NOT complete unless a map or aerial photo of the operation area is attached. Either one of these must show the operation area, access route, north arrow, scale, etc.)



"Stewardship in Forestry"

NOTIFICATION OF OPERATIONS/APPLICATION FOR PERMIT

STATE OF OREGON

DEPARTMENT OF FORESTRY



DEPARTMENT OF REVENUE

FILING THIS NOTIFICATION DOES NOT GRANT PERMISSION TO REMOVE FOREST PRODUCTS! FIRST OBTAIN PERMISSION FROM THE LANDOWNER AND TIMBER OWNER.

ON-SITE INSPECTIONS MAY BE CONDUCTED BY THE STATE FORESTER/STEWARDSHIP FORESTER TO ENSURE COMPLIANCE WITH STATE LAWS AND RULES GOVERNING FIRE PROTECTION AND FOREST PRACTICES ON PRIVATE LAND.

1. COUNTY Write in one county name:

2. NOTICE AND PERMIT TYPE

Check Appropriate Boxes (2A, 2B, and/or 2C)

- ☐ 2A NOTICE TO THE STATE FORESTER THAT OPERATION WILL BE CONDUCTED ON LANDS DESCRIBED ON REVERSE (ORS 527.670).
☐ 2B APPLICATION FOR PERMIT TO OPERATE POWER DRIVEN MACHINERY (ORS 477.625).
☐ 2C NOTICE TO THE STATE FORESTER AND THE DEPARTMENT OF REVENUE OF THE INTENT TO HARVEST TIMBER (ORS 321.550).

3. REPRESENTATIVE: PLEASE PRINT! Person to be contacted in case of Fire Emergency (Designated Representative). Area Code & Phone No.

4. Timber Sale Name and/or Number:

CHECK ONE BOX BELOW TO INDICATE WHO FILLED OUT THE APPLICATION.

5. OPERATOR ☐

ATTENTION: If you are conducting timber harvesting or road construction within 100 feet of overhead or underground utility lines, call the Oregon Utility Notification Center at 1-800-332-2344. Request that the owner of the line be notified, and record the number issued to you by the Oregon Utility Notification Center here:

Name
Business Name
Mailing Address - Street Address
City, State and Zip Code Area Code & Phone No.

6. LANDOWNER ☐

Timber harvesting may result in a tree planting requirement on the landowner. The landowner has the responsibility to reforest if the harvest results in an understocked condition. Call a Department of Forestry office for more information.

For activities or operations within an urban growth boundary, the applicant is advised to contact the appropriate local government regarding land use regulations which may apply to the future use or development of this site.

Name RC:
Business Name EG:
Mailing Address - Street Address S:
City, State and Zip code Area Code & Phone No.

7. TIMBER OWNER AND TAX PAYER ☐

You are required to provide a Social Security number OR Tax payer Identification number by the Oregon Department of Revenue's statute ORS 321.015. The Social Security number will be used ONLY for the purpose of identifying you to the Department of Revenue for the collection of Timber Tax.

Name
Business Name
Mailing Address - Street Address
City, State and Zip Code Area Code & Phone No.
Timber Owner Employer Identification Number OR Social Security Number

Notification Number:

OP TO LO

Geographic Area:

Date Received: Time:

Initials:

District Office:

Correction:

Please describe the intent of the operation, and any other information that may be relevant to the Stewardship Forester.

APPLICANT REMARKS:

Provide PHOTOCOPIES of the completed notification form and map to the local offices of the Water Resources Department and the Oregon Department of Fish and Wildlife IF AND ONLY IF you plan to use on-site water to mix pesticides or to control slash burns. In the applicant remarks section of the notification form identify the proposed water source. Addresses of the Water Resources and ODF&W offices are available in each Forestry office.

A notification is not considered accepted until it is received by the Forestry office that handles the location of your planned activity. Mail, fax or hand-deliver the notification form to the offices whose addresses are shown below.

For assistance filling out the notification form, contact your local ODF office.

OFFICE	COUNTIES COVERED	ADDRESS	PHONE NO.	FAX NO.
ASTORIA	Clatsop	92219 Hwy #202, 97103	503-325-5451	503-325-2756
BAKER CITY	Baker	2995 HUGHES LANE, 97814	541-523-5831	541-523-5874
CENTRAL POINT	Jackson	5286 TABLE ROCK ROAD, 97502	541-664-3328	541-776-6184
COLUMBIA CITY	Columbia, Clatsop	405 E STREET, 97018	503-397-2636	503-397-6361
COOS BAY	Coos, Curry, Douglas	63612 FIFTH STREET, 97420	541-267-4136	541-269-2027
DALLAS	Polk, Yamhill	825 OAK VILLA ROAD, 97338	503-623-8146	503-623-9034
FOREST GROVE	Tillamook, Washington, West Multnomah, Yamhill	801 GALES CREEK ROAD 97116-1199	503-357-2191	503-357-4548
FOSSIL	Wheeler, Morrow, Gilliam	45945 HWY 19, 97830	541-763-2575	541-763-2027
GRANTS PASS	Josephine	5375 MONUMENT DRIVE, 97526	541-474-3152	541-474-3158
JOHN DAY	Grant	PO BOX 546 97845 (400 NW 9 th)	541-575-1139	541-575-2253
KLAMATH FALLS	Klamath, Lake	3200 DELAP ROAD 97601	541-883-5681	541-883-5555
LAGRANDE	Baker, Malheur, Union	611 20TH STREET, 97850	541-963-3168	541-962-1058
LAKEVIEW	Lake, Klamath	2290 NORTH 4TH STREET, 97630	541-947-3311	541-947-3078
MEHAMA	Linn, Marion	22965 N. FORK ROAD SE, LYONS 97358	503-859-2151	503-859-2158
MOLALLA	Clackamas, East Multnomah	14995 S. HWY 211, 97038	503-829-2216	503-829-4736
MONUMENT	Grant, Wheeler	PO BOX 386, 97864 (MAY STREET)	541-934-2300	541-934-2301
PENDLETON	Umatilla, Grant, Morrow	1055 AIRPORT ROAD 97801	541-276-3491	541-276-0710
PHILOMATH	Benton	24533 ALSEA HWY, 97370	541-929-3266	541-929-5549
PRINEVILLE	Crook, Deschutes, Jefferson	3501 NE 3RD, 97754	541-447-5658	541-447-1469
ROSEBURG	Douglas	1758 NE AIRPORT ROAD, 97470-1499	541-440-3412	541-440-3424
SPRINGFIELD	Lane	3150 E. MAIN STREET, 97478	541-726-3588	541-726-2501
SWEET HOME	Linn	4690 HWY 20, 97386	541-367-6108	541-367-5613
THE DALLES	Hood River, Sherman, Wasco	3701 W. 13TH ST., 97058	541-296-4626	541-298-4993
TILLAMOOK	Tillamook	5005 THIRD STREET, 97141-2934	503-842-2545	503-842-3143
TOLEDO	Lincoln	763 NW FORESTRY ROAD, 97391	541-336-2273	541-336-5261
VENETA	Lane, Douglas	PO BOX 157, 97487 (87950 TERRITORIAL HWY)	541-935-2283	541-935-0731
WALLOWA	Wallowa	802 WEST HWY 82, 97885	541-886-2881	541-886-9085

PLEASE PRINT OR TYPE INFORMATION ONTO THE FORM. Please don't write in shaded areas. The instructions are numbered to match numbered areas on the notification form.

Instructions For Filling Out The Notification Of Operation/Application For Permits form 629-2-1-002A

File notice with the State Forester at least 15 days prior to the date you would like to start operating.

File a notification (form 629-2-1-002A) at an Oregon Department of Forestry (ODF) office if **any** of the following conditions apply:

- Your operation area is brand new.
- You are adding a new activity to the operation.
- You are changing or increasing the area involved in an existing operation.
- It is after February 28, and you are continuing an operation that has been idle since the end of the previous calendar year and you have not informed ODF you intend to continue the operation before now.

1. "COUNTY (Enter only one)." Fill in the county name where the operation will take place. If an operation spans two or more counties, file a separate notification for each county. The address list shows which counties are handled by which offices.
2. "NOTICE AND PERMIT TYPE" Check Appropriate Boxes (2A, 2B and/or 2C). Checkmark in the boxes next to the notices you are giving and/or the permit you need. Anyone filing a notification for hauling only should check box 2B.
3. "REPRESENTATIVE" The person ODF should contact in case of fire emergency. Print the name and phone number. This person must know what resources you have available to fight the fire and have the authority to commit those resources.
4. "Timber Sale Name and/or Number: This information is required for all state and federal sales and is optional for private land sales.
"CHECK ONE BOX NEXT TO 5, 6, OR 7 TO INDICATE WHO FILLED OUT THE APPLICATION."
5. "OPERATOR" The name, address and phone of the person or company who is doing the work.
6. "LANDOWNER" The name, address and phone of the person who owns the land. **Harvesting timber may result in a tree planting requirement for the landowner.** RC (Recipient Class) EG (Ethnic Group) and S (Size of land ownership) boxes gather information about the landowner. We ask you to voluntarily enter this information which we will use for annual reports. In these reports, no names are connected with the codes.

Recipient Class	Ethnic Group	Size
1. Local Government	1. Does not apply	1. Does not apply
2. State Government	2. White	2. 0-9 acres
3. Federal Government	3. Black	3. 10-99 acres
4. Individual/Non-industrial Private Forest Landowner (someone who owns 5,000 or fewer acres of forest land, and makes less than 50% of his or her annual income from the primary processing of forest products.)	4. Hispanic	4. 100-499 acres
5. Partnership/Corp. Industrial Forest Landowner	5. American Indian/Alaskan Native	5. 500-999 acres
6. Other (private landowner such as a church or non-profit organization.)	6. Asian/Pacific Islander	6. 1,000-4,999 acres
No number seven.	7. All Other	7. 5,000+ acres

7. "TIMBER OWNER AND TAX PAYER" Enter the name of the person or company, their address and phone number. Fill in EITHER the timber owner's Employer Identification number OR the timber owner's Social Security number. The Social Security number will be held in confidence. The party who owns timber at the point of first measure is the timber owner, and is responsible for paying the harvest and, if applicable, severance taxes.

8. "TYPE OF ACTIVITY." "UNIT NUMBERS" Assign a unit number between 1 and 99. A unit can be:
- A single operating area within a continuous boundary; or
 - An operating area with a state or federal sale unit number; or
 - A separate area within your total operation area on which you plan to conduct a single type of activity (for example, 30 acres of harvest type 3 only).

Multiple harvest units may be listed on one notification. **BUT**, if **HARVEST** units are separated by a mile or more (in a straight line), file separate notifications for each unit.

In all cases, all activities you plan on that unit should be listed beside the unit number. For example, road construction activity needed prior to starting a commercial timber harvest should be described along with the harvest activity. Multiple lines may be used for each unit to describe the activity.

Activity Code	Methods Used	Activity Code	Methods Used
1a. Commercial Thinning. Most of the conifer timber or large hard woods will remain uncut on the unit after harvesting (such as commercial thinning or selective cutting).	Cable/Ground/Other	2a. Road Construction 2b. Road Reconstruction 3. Site Preparation. (Do not use for building site preparation, this is preparing for planting.)	Dozer/Backhoe/Other Dozer/Backhoe/Other Manual/Mechanical/ Burning (not slash)
1b. Most, or all, conifer timber or large hardwoods will be cut and removed from the unit during harvesting (such as in clearcuts, shelterwood, and seed tree harvests).	Cable/Ground/Other	4a. Herbicide Application 4b. Insecticide Application 4c. Rodenticide Application 4d. Fertilizer Application 4e. Fungicide Application 4f. Repellent Application	Ground or Aerial/Common Name/Brand Name/ Carrier/Additives/ Application Rate (For fertilizer application only list all of the above plus the application rate)
1c. Felling only (no yarding or decking involved).	Other	5. Land Use Change Planned <ul style="list-style-type: none"> • to agricultural use • to residential use • to other uses Local government land use approval may be required.	
1d. Other Harvest Type not covered in 1a. or 1b. Describe in applicant's remarks box. (Examples are removal of just cedar timber from a mixed conifer stand, or creating salable chips.)		6. Treatment of Slash	Manual/Chemical/ Burning/Mechanical
1e. Sort Yard. A single location where woods-direct logs are stored prior to being taken to a mill.		7. Pre-commercial Thinning	Explain: EXAMPLES: rockpits used in roadway construction and chipping.
		8. Others	

"Quantity by Unit." Enter either the acres (A) or lineal feet (F) involved in the activity.

"Approximate Thousand Board Feet (MBF) Removed." List the approximate MBF to be removed, for each unit with commercial timber harvesting. For example 50 MBF = 50,000 Board Feet.

9. The starting date must be at least 15 days after the date the notification form is received by the appropriate ODF office.

10. "Site Codes." You must enter the W, S, and T conditions code(s) for each unit. Fill in concerns, waters, and resources code(s) when known. We are asking for your assistance in identifying units with characteristics that we are bound by law to protect. If you don't know whether any of these characteristics exist, go to item 12.

CONDITIONS	CONCERNS	WATERS	RESOURCES
W100 Within 100 feet of any lake, stream (a channel flowing surface water during some part of the year).	ARC(haeological) site. CGG Columbia Gorge General management area. CGS Columbia Gorge Scenic management area.	SIGNIF. WET. A wetland 8+ acres. OTHER WET (land). LAKE 8+ acres. OTHER LAKES STREAM A channel flowing surface water during some part of the year. EOS, important spring in Eastern Oregon. BOG Any size Bog. ES(tuary) A type of bay. DWS Domestic Water Supply. SEEP Water seeps out of ground, no flow evident.	BEN Bald Eagle Nesting site. BEP Bald Eagle foraging site. (A perch.) BER Bald Eagle Roosting site. BIO(logical) site of a rare life form or community: example, a rare snake pit. BPS Band-tailed Pigeon Spring. CC The operation will result in a single ClearCut or continuation of contiguous clearcuts that exceed 120 acres. CWD Columbia White Tail Deer. GBH Great Blue Heron nest site. GLD Golden eagle nest site. HLH High Landslide Hazard Location. MUR Marbled Murrelet nesting site. NSO Northern Spotted Owl nesting sites. OSP Presence of Osprey nest and key components. RAP Other Raptor nests. SBS Sensitive Bird roosting, nesting, watering site. T or E Threatened or Endangered species.
W300 Within 300 ft. of any estuary or any wetland greater than 8 acres.	SH Scenic Highway. The operation takes place near a FPA Scenic Highway.		
WNA Waters Not Applicable.	SW The operation takes place near a state Scenic Waterway.		
S1 No evidence of mass soil movement (landslides, slips, slumps).	UGB The operation takes place within an Urban Growth Boundary.		
S2 Evidence of old slides, small failures.	WG The operation takes place in the Willamette Greenway.		
S3 Recent or active movement; wet areas.			
T1 Slope of 0% to 35%.			
T2 Slope of 36% to 65%.			
T3 Slope greater than 65%.			

11. "Government Lot Numbers." Special numbers for map locations that do not fit the standard Township/Range grid.

12. "Location of Operation." If the activities codes description for a unit takes up several lines, REPEAT THE CODES ON EACH LINE: DO NOT REPEAT THE LEGAL DESCRIPTION.

13. To request a waiver of the 15-day waiting period, check the box and contact the Stewardship Forester (SF) at the ODF office where the notification is filed. The SF will decide if a waiver will be granted.

14. Print your name in 14a.; sign your name and write the date in 14b.

15. "ATTACH MAP AND/OR AERIAL PHOTOS!" The notification form is **NOT** complete unless a map or aerial photo of the operation area is attached.

On-site inspections may be conducted by the Stewardship Forester to ensure compliance with state laws and rules governing fire protection and forest practices on private land.

HOW TO BECOME A SUBSCRIBER TO RECEIVE NOTIFICATIONS OF OPERATIONS



Forest activities on private lands are regulated by the Oregon Forest Practices Act (FPA). This law requires applicants to notify the State Forester before they begin forest operations. An applicant must file a Notification of Operation form with the Oregon Department of Forestry (ODF) office at least 15 days before the operation starts. Operations include timber harvest, road construction and reconstruction, site preparation, slash treatment, chemical application, land use changes, and certain non-commercial forest activities.

Why Be a Subscriber?

Some citizens are interested in knowing if and when their neighbors are going to start an operation. For absentee landowners, it is an easy way to be informed about forest activities that border your forestland. Others want to review and make comments on planned operations in their watershed.

What Are the Smallest and Largest Areas I Can Subscribe to?

There is a minimum fee of **\$25** for up to five sections, plus \$5 for each section over five. You can also subscribe to an entire District or Unit by paying a maximum fee.

What Does a Subscriber Receive?

Under Option 1, a subscriber receives copies of all notifications of operations, maps, and any required written plans for specific legal descriptions by section. ODF is required to send these documents within three working days after they are submitted. Under Option 2, a subscriber receives the same material for an entire District or Unit. Subscribers who make written comments on plans for operations within 100 feet of Type F (fish bearing) or Type D (domestic use) streams, or within 300 feet of resource sites will want either of these options. Under Option 2a, a subscriber receives only notifications of operations and maps for an entire District or Unit. The subscription is good for one year.

How Do I Become a Subscriber?

Use the application form on the following page to choose an option and identify areas for which you are interested in receiving notifications of operation and to calculate the appropriate fees.

Subscriber Application

Name _____
Address _____
City, State, Zip _____
Phone Number _____

Company Name: _____

Signature _____

Date _____

Step 1. Pick the District you are interested in. Use one form per District. This form is for the _____ District (see page 3).

Step 2. Check one of the subscriber Options listed. The smallest subscriber area is one section (640 acres). Indicate the section(s) you are interested in by marking an "x" in the box(es) below the section number. Write the Township and Range numbers (example Township 9N, Range 11W). List only one Township and Range per line on the table. You can subscribe to the entire District by paying the maximum fee shown on page 3.

- ☐ Option 1: Check this box to receive Notifications of Operations, maps and written plans for the sections listed.

\$5.00
Fee per Section

- ☐ Option 2: Check this box to receive Notifications of Operations, maps and written plans for the entire District.

Maximum District Fee (from Page 3): \$_____

- ☐ Option 2a: Check this box to only receive Notifications of Operations & maps for the entire District.

Maximum District Fee (from Page 3): \$_____

Subscription Location Table																																				TOWNSHIP	RANGE	NUMBER OF SECTIONS	ENTER FEE/SECTION	FEE
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36					
																																					X	=		
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																																				(There is a \$25 minimum fee.)	TOTAL FEES:		\$	

Step 3. Enclose a check or money order made out to the **"State Forester"** for the total amount for this District. Mail each form and payment to the District or Unit Office, or go to the office and pay at the counter.

DISTRICT and UNIT OFFICES

Maximum District Fee Option 2*	Maximum District Fee Option 2a* (no written plans)	DISTRICT and Unit Offices with Zip Codes	Counties Covered by the Offices	Address	Telephone
\$828	\$724	ASTORIA Astoria 97103	Clatsop	Rt. 1, Box 950	503 325-5451
\$798	\$755	CENTRAL OREGON The Dalles 97058	Hood River, Sherman, Wasco	3701 W 13 th	541 296-4626
		John Day 97845	Grant	P.O. Box 546	541 575-1139
		Fossil 97830	Jefferson, Crook, Deschutes, Crook	45945 Hwy. 19	541 763-2575
		Prineville 97754	Deschutes, Jefferson	3501 E. 3rd	541 447-5658
\$2,963	\$2,590	CASCADE (Clack-Marion) Lyons 97358	Linn, Marion	22965 N Fork Rd. SE	503 859-2151
		Molalla 97038	Clackamas, East Multnomah	14995 S Hwy. 211	503 829-2216
\$2,924	\$2,555	COOS Coos Bay 97420	Coos, Curry, Douglas	300 Fifth St., Bay Park	541 267-4136
\$2,062	\$1,802	DOUGLAS Roseburg 97470	Douglas	1758 NE Airport Rd.	541 440-3412
\$2,356	\$2,059	CASCADE (East Lane) Springfield 97478	Lane	3150 E Main St.	541 726-3588
\$3,475	\$3,036	FOREST GROVE Columbia City 97018	Columbia, Clatsop	405 E Street	503 397-2636
		Forest Grove 97116	North Yamhill, Washington, Tillamook, West Multnomah	801 Gales Creek Rd.	503 357-2191
\$1,153	\$1,090	KLAMATH-LAKE Klamath Falls 97601	Klamath, Lake	3200 Delap Road	541 883-5681
		Lakeview 97630	Lake, Klamath	2290 N 4 th St.	541 947-3311
\$1,068	\$935	CASCADE (Linn) Sweet Home 97386	Linn	4690 Hwy 20	541 367-6108
\$754	\$713	NORTHEAST OREGON Baker City	Baker	2995 Hughes Ln	541 523-5831
		La Grande 97850	Union, Baker, Malheur	611 20 th St.	541 963-3168
		Pendleton 97801	Umatilla, Grant, Morrow	1055 Airport Rd.	541 276-3491
		Wallowa 97885	Wallowa	802 West Hwy. 82	541 886-2881
\$2,367	\$2,069	SOUTHWEST OREGON Central Point 97502	Jackson	5286 Table Rock Rd.	541 664-3328
		Grants Pass 97526	Josephine	5375 Monmouth Dr.	541 474-3152
\$516	\$498	TILLAMOOK Tillamook 97141	Tillamook	4907 E. Third St.	503 842-2545
\$2,282	\$1,994	WESTERN LANE Veneta 97487	Lane, Douglas	P.O. Box 157	541 935-2283
\$3,728	\$3,258	WEST OREGON Philomath 97370	Benton, Lincoln, Polk	24533 Alsea Hwy.	541 929-3266
		Dallas 97338	Polk, South Yamhill	825 Oak Villa Rd.	503 623-8146
		Toledo 97391	Lincoln	763 NW Forestry Rd.	541 336-2273

*Option 2: Includes all Notifications, Maps, Written Plans for the entire District for one year.

*Option 2a: Includes only Notifications and Maps for the entire District for one year.

LEGAL SUBDIVISION

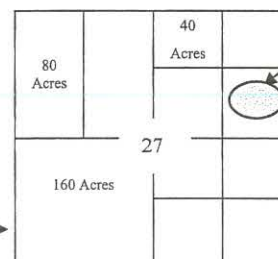
Each township is six miles square and is divided into 36 sections. Each section is one mile square.

One section contains 640 acres that can be divided into smaller tracts.

This is T9S, R11W.

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

This is Section 27.



A proposed operation.



Oregon Department of Forestry

2600 State Street
Salem, OR 97310
(503) 945-7200
TDD 1-800-437-4490

Tour of Oregon Forestry and Pesticide Use Issues Trip Report

Photo Log: June 16-18, 2010

1. Weyerhaeuser Fish Creek Units (June 16, 2010)	
Weyerhaeuser Site 1	Standing atop ridge looking southeast out over various stages of harvest and replanting
Weyerhaeuser Site 2	Close up of harvest occurring near Fish Creek Unit #1
Weyerhaeuser Site 3	Riparian buffer along creek that runs adjacent to Weyerhaeuser units
Weyerhaeuser Site 4	Looking North-Northwest (NNW) from the ridge towards Triangle Lake
Weyerhaeuser Site 5	Looking NNW from the ridge towards Triangle Lake
Weyerhaeuser Site 6	Close up of clear cut and various stages of re-growth on the far side of Triangle Lake when looking NNW
Weyerhaeuser Site 7	Close up of the valley floor near Triangle Lake where local residents live near to harvest operations
Weyerhaeuser Site 8	Looking Northwest from the riparian buffer zone along the creek up into Fish Creek Unit #2
Weyerhaeuser Site 9	Close up of looking from the riparian zone into Fish Creek Unit #2
Weyerhaeuser Site 10	Map of Weyerhaeuser units and distances to concerned community members (See Attachment 5)
2. Seneca Jones Fish Creek Unit (June 16, 2010)	
Seneca Jones Site 1	Looking North from the unit over the adjacent ridge and onto Triangle Lake
Seneca Jones Site 2	Looking directly at the unit noting the slope and the large maples which will need to be treated
Seneca Jones Site 3	Looking into the ravine noting the slope of unit which was sprayed by helicopter
Seneca Jones Site 4	Looking at the high point on the unit
3. Triangle Lake School (June 16, 2010)	
Triangle Lake School 3	Triangle Lake School property which was clear cut under an agreement with Weyerhaeuser but not maintained after
Triangle Lake School 4	Comparison between school property (on the right) and maintained Weyerhaeuser property (on the left upper hill)
4. Congdon Creek (June 17, 2010)	
Congdon Creek 1	Congdon Creek clear cut with adjacent forest and wildlife trees left standing
Congdon Creek 2	Clear cut along Congdon Creek, unit was cut adjacent to the road
Congdon Creek 3	Clear cut along Congdon Creek, unit was cut adjacent to the road

Congdon Creek 4	Clear cut along Congdon Creek, unit was cut adjacent to the road and private residences along the other side of the road
Congdon Creek 5	Adjacent woods to the clear cut
5. Triangle Lake School (June 17, 2010)	
Triangle Lake School 1	Comparison between school property (on the right) and maintained Weyerhaeuser property (on the left upper hill)
Triangle Lake School 2	Triangle Lake School property which was clear cut under an agreement with Weyerhaeuser but not maintained after
Triangle Lake School 5	Triangle Lake School property which was clear cut under an agreement with Weyerhaeuser but not maintained after
Triangle Lake School 6	Close up of maples out competing the firs which were planted after harvest
6. Triangle Lake (June 17, 2010)	
Triangle Lake 1	Looking East across Triangle Lake to units on the far side of the lake
Triangle Lake 2	Looking East across Triangle Lake to units on the far side of the lake
Triangle Lake 3	Looking East across Triangle Lake to units on the far side of the lake
Triangle Lake 4	One of the community members taking pictures during the tour give by the Pitchfork Rebellion
Triangle Lake 5	Close up of a unit on the East shore of Triangle Lake and a house at the base of the unit
Triangle Lake 6	Looking East across Triangle Lake to units on the far side of the lake
Triangle Lake 7	Close up of a unit on the East shore of Triangle Lake and a house at the base of the unit
Triangle Lake 8	Looking East across Triangle Lake to units on the far side of the lake
7. Rock Slide Park (June 17, 2010)	
Rock Slide Park 1	Site on the far bank of Lake Creek
Rock Slide Park 2	Close up of the site on the far bank of Lake Creek – note the slope of the unit
Rock Slide Park 3	Lake Creek, a salmon bearing creek that runs from Triangle Lake, along Highway 36, and to the Pacific Ocean
Rock Slide Park 4	Rock Slide Park in Lake Creek where Owen stated local children play on the rocks and in the rapids
Rock Slide Park 5	Site on the far bank of Lake Creek
Rock Slide Park 6	Close up of the site on the far bank of Lake Creek – note the slope of the unit
8. Day Owen's Property (June 17, 2010)	
Day Owen's Property 1	Owen's organic farm along Hwy 36 – near by properties

	include BLM, Seneca Timber, and Weyerhaeuser
Day Owen's Property 2	Timber land behind Owen's property that will be harvested in the future
Day Owen's Property 3	Owen's organic farm along Hwy 36 – near by properties include BLM, Seneca Timber, and Weyerhaeuser
Day Owen's Property 4	A clear cut across the highway from Owen's property
Day Owen's Property 5	Close up of the clear cut across the highway from Owen's property with a cloud – note boarder trees and wildlife tree
Day Owen's Property 6	Owen's organic farm along Hwy 36 – near by properties include BLM, Seneca Timber, and Weyerhaeuser
Day Owen's Property 7	The clear cut across the highway from Owen's property with cloud
Day Owen's Property 8	Ridgeline near Owen's property – the other side of the slope has been harvested
Day Owen's Property 9	Close up of ridgeline near Owen's property – the other side of the slope has been harvested
Day Owen's Property 10	Tributary to Lake Creek that flows from the hills behind Owen's property, through his property, and into Lake Creek
Day Owen's Property 11	The hills from where the tributary to Lake Creek flows from
Day Owen's Property 12	Tributary to Lake Creek that flows from the hills behind Owen's property, through his property, and into Lake Creek
Day Owen's Property 13	Clear cuts across the highway from Owen's property
Day Owen's Property 14	Close up of the clear cut across the highway from Owen's property with a cloud wisp – note boarder trees and wildlife tree
Day Owen's Property 15	Clear cuts across the highway from Owen's property
Day Owen's Property 16	Cloud moving along the hills
Day Owen's Property 17	Ridgeline near Owen's property – the other side of the slope has been harvested
Day Owen's Property 18	Tributary to Lake Creek that flows from the hills behind Owen's property, through his property, and into Lake Creek
Day Owen's Property 19	Tributary to Lake Creek that flows from the hills behind Owen's property, through his property, and into Lake Creek
9. Linda Winkle's Property (June 17, 2010)	
Linda Winkle's Property 1	Linda Winkle's garden which is located partially on Roseburg property (clear cut in the background)
Linda Winkle's Property 2	Clear cut adjacent to Winkle's property
Linda Winkle's Property 3	Linda Winkle's garden which is located partially on Roseburg property (clear cut in the background)
Linda Winkle's Property 4	The edge of Winkle's property, wildlife trees on the clear cut are seen in the background
Linda Winkle's Property 5	The edge of Winkle's property and the clear cut
Linda Winkle's Property 6	Wildlife trees on the clear cut are seen through the brush on Winkle's property
Linda Winkle's Property 7	Roseburg clear cut seem from Winkle's property

Linda Winkle's Property 8	Roseburg clear cut seem from Winkle's property
Linda Winkle's Property 9	Roseburg clear cut seem from Winkle's property
Linda Winkle's Property 10	Linda Winkle's garden which is located partially on Roseburg property (wildlife trees in the background)
Linda Winkle's Property 11	Roseburg clear cut seem from Winkle's property
Linda Winkle's Property 12	Wildlife trees on the clear cut are seen through the brush on Winkle's property
10. Highway 36 (June 17, 2010)	
Along Hwy 36 1	Clear cuts along Highway 36 as seen while driving along the highway (Lake Creek is located near the base of the clear cut)
Along Hwy 36 2	Clear cuts along Highway 36 as seen while driving along the highway (Lake Creek is located near the base of the clear cut)
Along Hwy 36 3	Clear cuts along Highway 36 as seen while driving along the highway (Lake Creek is located near the base of the clear cut)
11. Deadwood (June 17, 2010)	
Deadwood Meeting 1	Stu Turner's presentation during the meeting held at a residence near Deadwood Community Center
Deadwood Meeting 2	Participants at the meeting held at a residence near Deadwood Community Center
12. Kohlman Vineyard (June 17, 2010)	
Kohlman Vineyard 1	Kevin Kohlman's upper vineyard and forestry land on the adjacent hills
Kohlman Vineyard 2	Grape plants that are growing sparsely in Kohlman's vineyard
Kohlman Vineyard 3	Upper vineyard with Tyee Resources Unit in the background behind the large evergreen trees
Kohlman Vineyard 4	Upper vineyard with Tyee Resources Unit in the background
Kohlman Vineyard 5	Close up of Tyee Resources Unit
Kohlman Vineyard 6	Close up of Tyee Resources Unit
Kohlman Vineyard 7	Grape plants growing in the upper vineyard
Kohlman Vineyard 8	Grape plants growing in the upper vineyard
Kohlman Vineyard 9	Kevin Kohlman's upper vineyard and forestry land on the adjacent hills
Kohlman Vineyard 10	Upper vineyard with Tyee Resources Unit in the background
Kohlman Vineyard 11	Upper vineyard with Tyee Resources Unit in the background
Kohlman Vineyard 12	Grape plant in the upper vineyard
Kohlman Vineyard 13	Leaf curl on grape plant in the upper vineyard
Kohlman Vineyard 14	Upper vineyard
Kohlman Vineyard 15	Upper vineyard
Kohlman Vineyard 16	Upper vineyard showing missing grape plants
Kohlman Vineyard 17	Hills behind Kohlman's vineyard
Kohlman Vineyard 18	Upper vineyard showing missing grape plants
Kohlman Vineyard 19	Hills behind Kohlman's vineyard

Kohlman Vineyard 20	Upper vineyard showing missing grape plants
Kohlman Vineyard 21	Upper vineyard
Kohlman Vineyard 22	Dead grape plant in upper vineyard
Kohlman Vineyard 23	Lower vineyard with units in the background
Kohlman Vineyard 24	Low corner of the lower vineyard near to pond (plant's roots are never out of the water table)
Kohlman Vineyard 25	Upper vineyard with Tyee Resources unit in the background
Kohlman Vineyard 26	Upper vineyard with Tyee Resources unit in the background
Kohlman Vineyard 27	Upper vineyard with Tyee Resources unit in the background
Kohlman Vineyard 28	Upper vineyard with forestry units in the background
Kohlman Vineyard 29	Upper vineyard with forestry units in the background
Kohlman Vineyard 30	Upper vineyard showing missing grape plants
Kohlman Vineyard 31	Upper vineyard showing missing grape plants
Kohlman Vineyard 32	Hills behind Kohlman's vineyard
Kohlman Vineyard 33	Lower vineyard with forestry units in the background
Kohlman Vineyard 34	Low corner of the lower vineyard near to pond (plant's roots are never out of the water table)
Kohlman Vineyard 35	Low corner of the lower vineyard near to pond with Tyee Resources unit in the background
Kohlman Vineyard 36	Close up of Tyee Resources unit

13. Cedar Flats (June 18, 2010)

Cedar Flats 1	Front yard of Art Paz's yard - adjacent to his organic blueberry farm
Cedar Flats 2	Front yard of Art Paz's yard - adjacent to his organic blueberry farm
Cedar Flats 3	Front yard of Art Paz's yard - looking down driveway at clear cut
Cedar Flats 4	Looking down the access road to Paz's property - adjacent to clear cut
Cedar Flats 5	Clear cut adjacent to the road
Cedar Flats 6	Clear cut adjacent to the road
Cedar Flats 7	Clear cut adjacent to the road
Cedar Flats 8	Clear cut adjacent to the road
Cedar Flats 9	Clear cut adjacent to the road
Cedar Flats 10	Looking back to Art Paz's blueberry farm from road
Cedar Flats 11	Paz's blueberries
Cedar Flats 12	Paz's blueberries
Cedar Flats 13	Looking from blueberry patch towards clear cut ... just on the other side of the trees
Cedar Flats 14	Zoomed in - looking from blueberry patch towards clear cut ... just on the other side of the trees
Cedar Flats 15	Walking the road from Paz's to the Weyerhaeuser clear cut
Cedar Flats 16	Upper part of the clear cut
Cedar Flats 17	Looking out over the clear cut
Cedar Flats 18	Zoomed in - looking out over the clear cut near Everett's property
Cedar Flats 19	Looking out over the clear cut - Paz's property at tree line
Cedar Flats 20	Everett's property leading to pond feed by natural spring in clear cut
Cedar Flats 21	Everett's property leading to pond feed by natural spring in clear cut

Cedar Flats 22	Halbert and Everett's looking at pond
Cedar Flats 23	Close-up of Everett's pond
Cedar Flats 24	Riparian area around Everett's pond
Cedar Flats 25	Natural spring - sourced from the clear cut - can see lightness through trees from clear cut
Cedar Flats 26	Looking up over the clear cut from Everett's property – source of spring is at the base of the snag in the center of the photograph
Cedar Flats 27'	Looking up over the clear cut from Everett's property
Cedar Flats 28	Looking up over the clear cut from Everett's property toward Paz residence
Cedar Flats 29	Small creek feeding Everett's pond – photograph was taken at the edge of Everett's property
Cedar Flats 30	Looking back up the ravine toward the natural spring
Cedar Flats 31	Looking up over the clear cut from Everett's property – source of spring is at the base of the snag in the center of the photograph
Cedar Flats 32	Small creek feeding Everett's pond – photograph was taken at the edge of Everett's property
Cedar Flats 33	Looking east along edge of clear cut by Everett's property

CD Available upon Request

Tour of Oregon Forestry and Pesticide Use Issues Trip Photos

Photos taken by Chad Schulze and Erin Halbert
(June 16-18, 2010)



Attachment 4: Tour of Oregon
Forestry and Pesticide
Use Issues Trip Report



Weyerhaeuser Site 7.JPG



Weyerhaeuser Site 8.JPG



Weyerhaeuser Site 9.JPG



Weyerhaeuser Site 10.JPG



Weyerhaeuser Site 1.JPG



Weyerhaeuser Site 2.JPG



Weyerhaeuser Site 3.JPG



Weyerhaeuser Site 4.JPG



Weyerhaeuser Site 5.JPG



Weyerhaeuser Site 6.JPG



Seneca Jones Site 4.JPG



Seneca Jones Site 1.JPG



Seneca Jones Site 2.JPG



Seneca Jones Site 3.JPG



Triangle Lake School 4.JPG



Triangle Lake School 3.JPG



Congdon Creek 4.JPG



Congdon Creek 5.JPG



Congdon Creek 1.JPG



Congdon Creek 2.JPG



Congdon Creek 3.JPG



Triangle Lake School 2.JPG



Triangle Lake School 5.JPG



Triangle Lake School 6.JPG



Triangle Lake School 1.JPG



Triangle Lake 6.JPG



Triangle Lake 7.JPG



Triangle Lake 8.JPG



Triangle Lake 1.JPG



Triangle Lake 2.JPG



Triangle Lake 3.JPG



Triangle Lake 4.JPG



Triangle Lake 5.JPG



Rock Slide Park 4.JPG



Rock Slide Park 5.JPG



Rock Slide Park 6.JPG



Rock Slide Park 1.JPG



Rock Slide Park 2.JPG



Rock Slide Park 3.JPG



Day Owen's Property
16.JPG



Day Owen's Property
17.JPG



Day Owen's Property
18.JPG



Day Owen's Property
19.JPG



Day Owen's Property 1.JPG



Day Owen's Property 2.JPG



Day Owen's Property 3.JPG



Day Owen's Property 4.JPG



Day Owen's Property 5.JPG



Day Owen's Property 6.JPG



Day Owen's Property 7.JPG



Day Owen's Property 8.JPG



Day Owen's Property 9.JPG



Day Owen's Property
10.JPG



Day Owen's Property
11.JPG



Day Owen's Property
12.JPG



Day Owen's Property
13.JPG



Day Owen's Property
14.JPG



Day Owen's Property
15.JPG



Linda Winkle's Property
8.JPG



Linda Winkle's Property
9.JPG



Linda Winkle's Property
10.JPG



Linda Winkle's Property
11.JPG



Linda Winkle's Property
12.JPG



Linda Winkle's Property
1.JPG



Linda Winkle's Property
2.JPG



Linda Winkle's Property
3.JPG



Linda Winkle's Property
4.JPG



Linda Winkle's Property
5.JPG



Linda Winkle's Property
6.JPG



Linda Winkle's Property
7.JPG



Along Hwy 36 3.JPG



Along Hwy 36 1.JPG



Along Hwy 36 2.JPG



Deadwood Meeting 2.JPG



Deadwood Meeting 1.JPG



Kohlman Vineyard 35.JPG



Kohlman Vineyard 36.JPG



Kohlman Vineyard 1.JPG



Kohlman Vineyard 2.JPG



Kohlman Vineyard 3.JPG



Kohlman Vineyard 4.JPG



Kohlman Vineyard 5.JPG



Kohlman Vineyard 6.JPG



Kohlman Vineyard 7.JPG



Kohlman Vineyard 8.JPG



Kohlman Vineyard 9.JPG



Kohlman Vineyard 10.JPG



Kohlman Vineyard 11.JPG



Kohlman Vineyard 12.JPG



Kohlman Vineyard 13.JPG



Kohlman Vineyard 14.JPG



Kohlman Vineyard 15.JPG



Kohlman Vineyard 16.JPG



Kohlman Vineyard 17.JPG



Kohlman Vineyard 18.JPG



Kohlman Vineyard 19.JPG



Kohlman Vineyard 20.JPG



Kohlman Vineyard 21.JPG



Kohlman Vineyard 22.JPG



Kohlman Vineyard 23.JPG



Kohlman Vineyard 24.JPG



Kohlman Vineyard 25.JPG



Kohlman Vineyard 26.JPG



Kohlman Vineyard 27.JPG



Kohlman Vineyard 28.JPG



Kohlman Vineyard 29.JPG



Kohlman Vineyard 30.JPG



Kohlman Vineyard 31.JPG



Kohlman Vineyard 32.JPG



Kohlman Vineyard 33.JPG

12. Kohlman Vineyard



Kohlman Vineyard 34.JPG



Cedar Flats 32.JPG



Cedar Flats 33.JPG



Cedar Flats 1.JPG



Cedar Flats 2.JPG



Cedar Flats 3.JPG



Cedar Flats 4.JPG



Cedar Flats 5.JPG



Cedar Flats 6.JPG



Cedar Flats 7.JPG



Cedar Flats 8.JPG



Cedar Flats 9.JPG



Cedar Flats 10.JPG



Cedar Flats 11.JPG



Cedar Flats 12.JPG



Cedar Flats 13.JPG



Cedar Flats 14.JPG



Cedar Flats 15.JPG



Cedar Flats 16.JPG



Cedar Flats 17.JPG



Cedar Flats 18.JPG



Cedar Flats 19.JPG



Cedar Flats 20.JPG



Cedar Flats 21.JPG



Cedar Flats 22.JPG



Cedar Flats 23.JPG



Cedar Flats 24.JPG



Cedar Flats 25.JPG



Cedar Flats 26.JPG



Cedar Flats 27.JPG



Cedar Flats 28.JPG



Cedar Flats 29.JPG

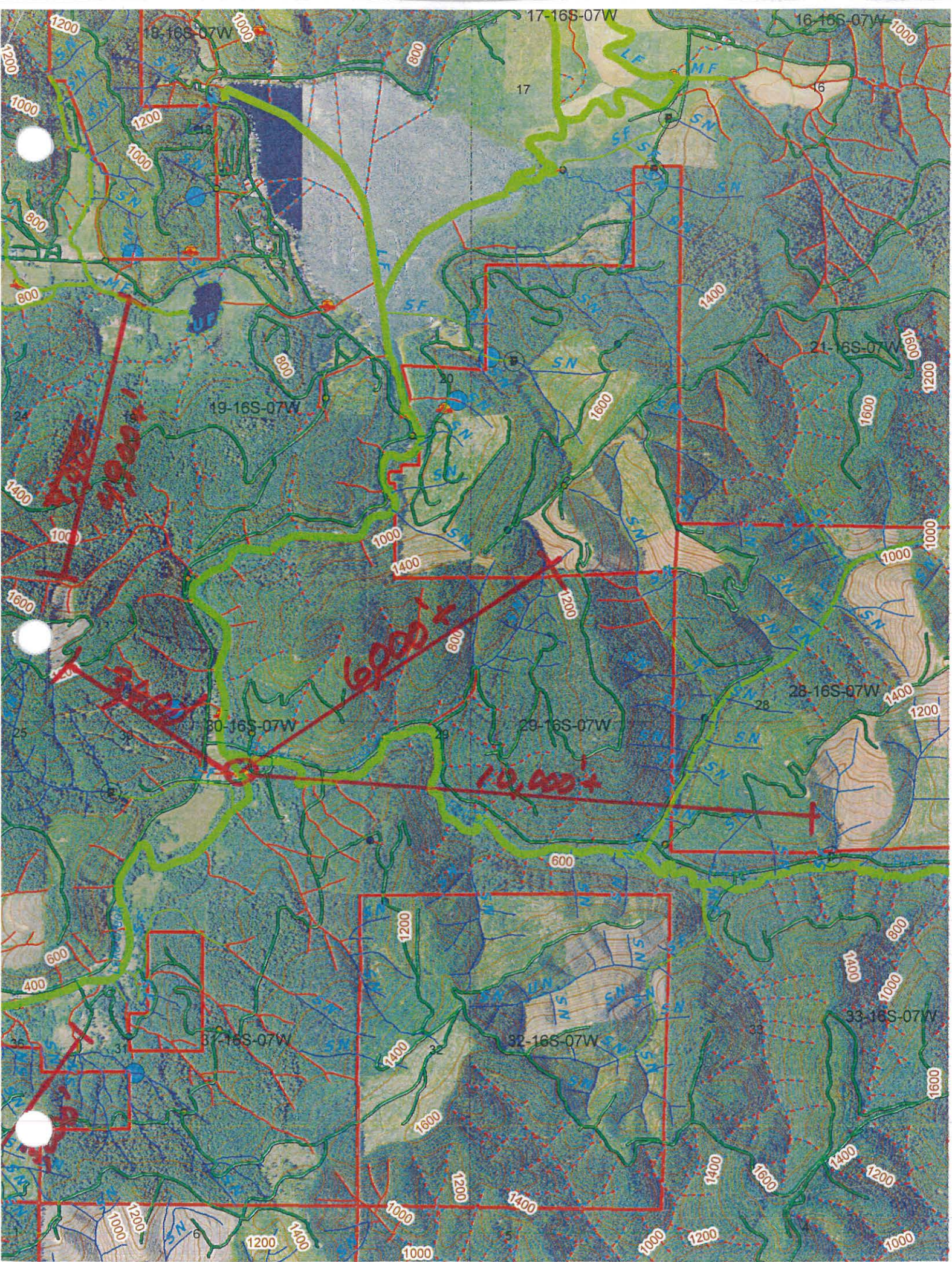


Cedar Flats 30.JPG



Cedar Flats 31.JPG

13. Cedar Flats



Oregon Department of Forestry
District: Western Lane

AUTO
Office: Veneta

Notification: 09-50075 [78129044]
County: Lane

Received by ODF on January 26, 2009 by mail

* REPRINT * * Edited *

- Operation notice.

* 15 DAY WAITING PERIOD REQUIRED *

T/S : 2009 Aerial Herbaceous Program

Operator:
Mike Emmons
Seneca Jones Timber Co, L P
P O Box 10265
Eugene, OR 97440
(541) 461-6245

Land owner:
Mike Emmons
Seneca Jones Timber Co, L P
P O Box 10265
Eugene, OR 97440
(541) 461-6245

Timber owner:
No Timber Owner Found

Fire contact: Ted Reiss (541) 607-7299
Signed by: Mike Emmons
Subscribers: CB05 JW09

For: Land owner

N C

Department of Forestry

Notification: 09-50075 [78129044]

Unit: 1 Status: Active
Stewardship Forester: Paul Clements
Start date: 2/23/2009 End date: 6/30/2009

Phone number: (541) 935-2283

Site conditions: Lake or Stream within 100 ft
Slope of 0% to 35%
No mass soil movement

FP = L

FPA = H

Acres: 16 Feet: Estimated harvest: MBF
Activity: Herbicide Application
Methods: Aerial
Brand name: Triclopyr 4 Ester_LV6(2 4D)_Terrain
Additives: Transline_Glystar_Altrazine 4L
Other information: Velpar L And DF_SFM 75_Oust

Carrier: None
App rate: 10 And 15 Gal Per Acre

Sc	Twp	Rge	Government lot	N n e	E n w	S n w	S n w	S n w	S n w	S n w	S n w	S n w	S n w	Harv tax	Reg use
30	16S	07W													WT1

Water Concern Information

Description	Classification	Rule
Lake Creek Trib	Unknown class	

danandmaya@gmail.com

Map #16073000
TAX LOT #200

3/4/09-Application received. ODF (Clemens) observed.
Dan Gee - 927-3326 expressed outrage.
Sent email to Gee on 3/5/09 @ 1720.

3/7- Rec'd emails from Maya Gee.

3/9- sent emails, j'egs to Mike Emmons : memmons@seneca
slawmill.co

09-50075



DEPARTMENT OF REVENUE

PROTECTION AND FOREST PRACTICES

ON REVERSE (ORS 527.670).

ST TIMBER (ORS 321.550).

Notification Number:

OP

TO

LO

Geographic Area:

Date Received

Time:

Initials:

District:

Office:

Please describe the intent of the operation and any other information that may be relevant to the Forest Practices Forest

APPLICANT REMARKS:

Aerial Application Consisting of multiple chemicals that may be applied at 10 & 15 gal/ac rates

List Includes:

Triclopyr 4-Ester

LV6 (2,4-D)

Terrain

Transline

Glystar 5

Atrazine 4L

Velpar L & DF

SFM 75,Oust

1-541-461-6245

RC:

EG:

S:

1-541-461-6245

WOSTOT Certificate #

rtificate Number box above.

ier:

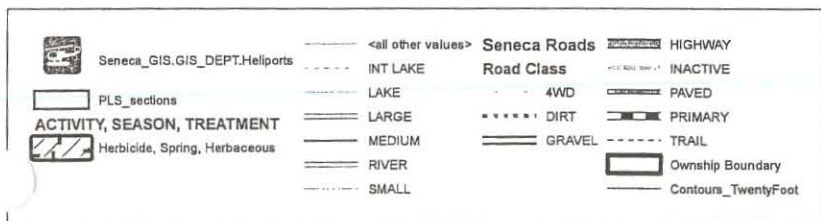
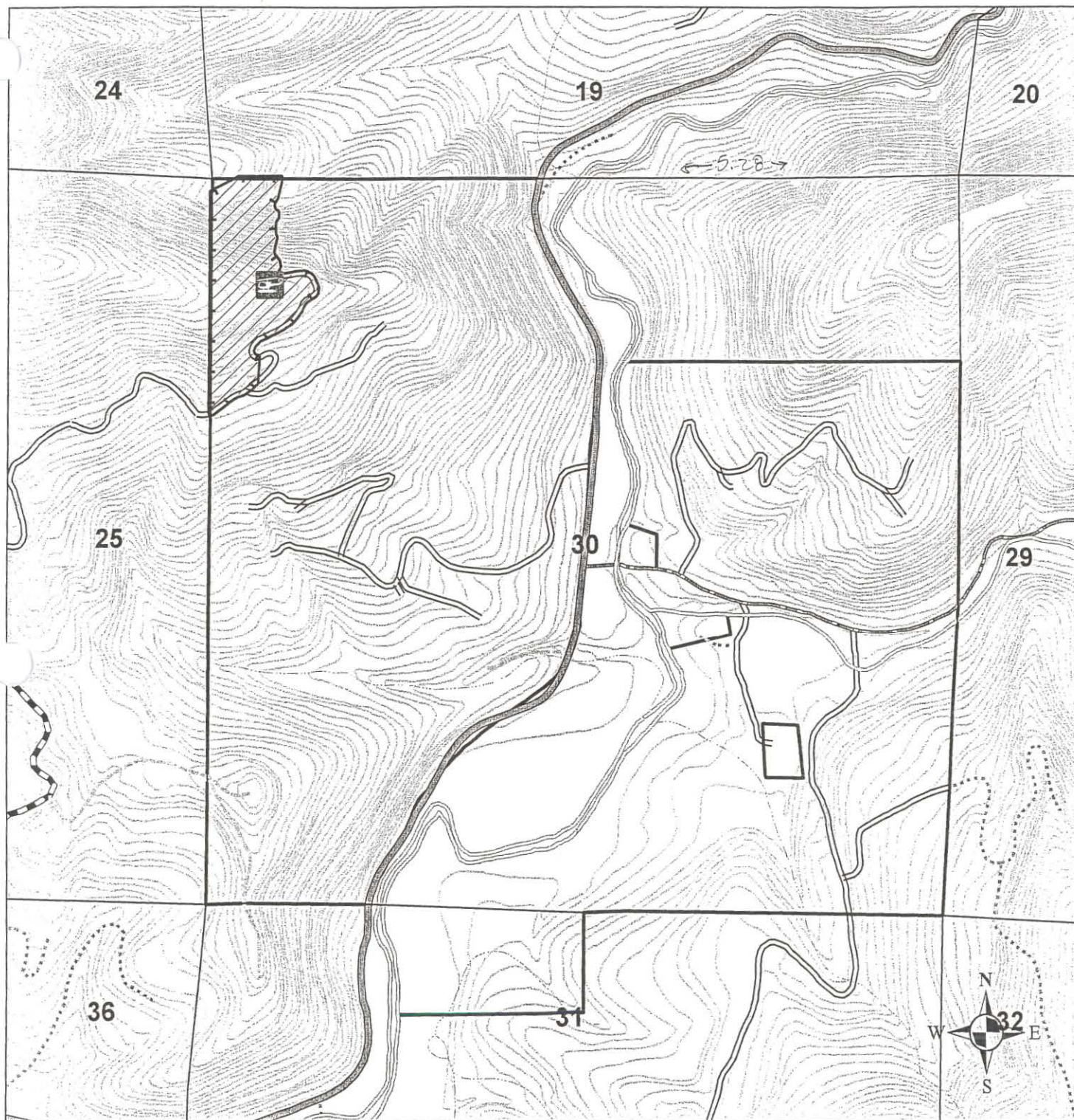
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mm.



**SENECA JONES
TIMBER COMPANY**

Twp. 16S Rng. 07W Sec 30

1" = 1000' +/-



**Fish Creek North
16 Acres
2009 Aerial Herb
2nd Year**

Unit #1

123 35' 28.496"W
44 9' 12.221"N

FANS Map

TWP 16S, R07W - SEC 19 - TAX LOT 600

OWNER: DANIEL T. GEE
54.6 AC, ZONED F-40



Legend

- ▲ 06 NSO Update
- ▲ Bald Eagle
- Land Slide Leave Trees
- ▲ Marbled Murrelet
- ▲ Peregrine Falcon
- ▲ Railroads
- ▲ Taxlots Lane
- Urban Growth Bdy
- Western Lane Boundary

3/9/09 -

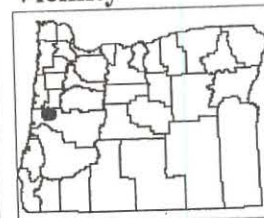
RE: 09-50075
UNIT # 1

FANS MAP
ILLUSTRATES
RELATIVE LOCATION
OF DAN GEE LANDS
TO Seneca Jones LANDS.

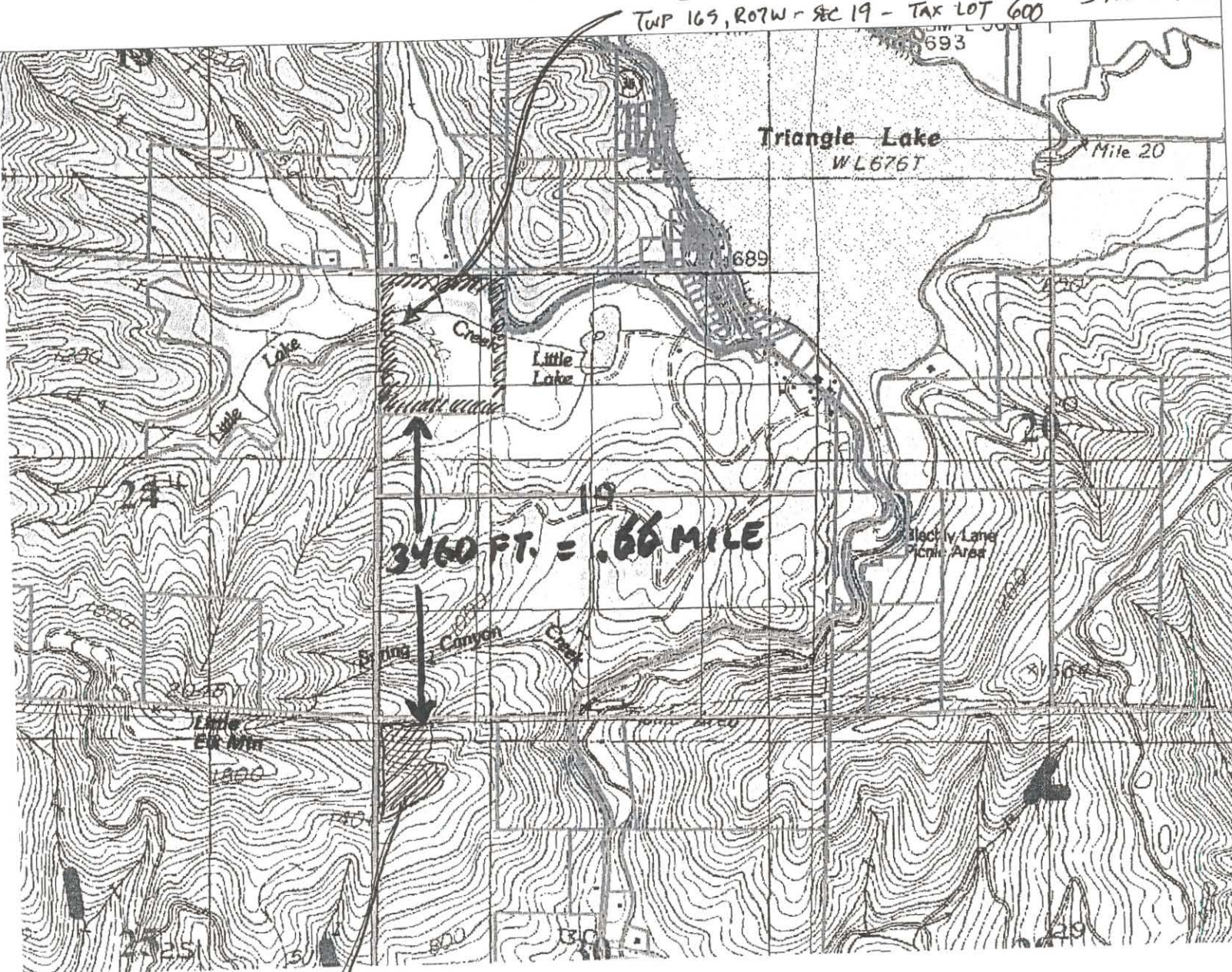


1 in. = 1732 ft.

Vicinity



Oregon Department of Forestry
03/09/2009



"FISH CREEK NORTH"
AREA TREATED, 3/4/09 -
16 ACRES

TWP 16S, R07W - SEC 30 TAX LOT 200

54.6 AC. ZONED F-1

Seneca Jones Timber Co.

CLEMENTS Paul R

From: Maya Gee [danandmaya@gmail.com]
Sent: Saturday, March 07, 2009 10:02 AM
To: CLEMENTS Paul R; GRANT.S.SMITH@state.or.us
Subject: Re: five jpg files of sixteen; four sent yesterday

Thank you for the photos. I know that site very well from last years spray that sickened both my wife and our neighbors for weeks.

First I will say that I know exactly where Paul is stationed to take the photo's sent.

Photo 4014: Taken in the very early morning hours before tanker or helicopter have arrived. (Valley fog below)

Ph 4016: Spray tanker facing the ridge that Paul has stationed himself high upon. The tanker and Chevy truck are parked on a dead end platform that was used for stationing logs and turning around logging trucks. Everything left of the tanker is the slope towards our valley; everything right of the tanker is the slope towards Hwy 36 or the road out of the site.

Ph 4019: Spray helicopter heading down slope in our valley with obvious fog/mist.

Ph 4020: Paul for some reason has not walked to edge of the ridge that the helicopter is spraying in our valley (not one photo taken of this side of the spray site??)

Photo's 18 not shown.....

To be continued on other emails.

D/M

On Fri, Mar 6, 2009 at 11:25 AM, CLEMENTS Paul R <Paul.R.Clements@state.or.us> wrote:

|

CLEMENTS Paul R

From: Maya Gee [danandmaya@gmail.com]
Sent: Saturday, March 07, 2009 10:37 AM
To: CLEMENTS Paul R
Cc: SMITH Grant S
Subject: Re: jpgs; last two of total of sixteen

Photo #28/29: Both pictures of spray helicopter arriving from and departing to our valley for application. Again not one photo taken of our valley. This valley is very steep. So steep that it is the reason given to us from Seneca Jones on why they have to helicopter spray and not back pack spray this site.

Paul has hiked up to a very good vantage point to possibly get some excellent photos of our valley side ridge but has failed to do so. Photo's taken do show clearly no fog where tanker and spray helicopter are refilling. (which does not matter in this case) Not one photo shows helicopter descending into the morning fog/mist to spray a cocktail of poisonous herbicides above our valley where family domains exist.

Again ODF officials have not done their job to protect the health of the children, families, and animals that reside in these Coastal Mountain paradise.

ODF officials do have the power under existing laws to cancel a spray operation under these conditions and we know that from now on that they will do so to protect the citizens who have placed them in the jobs that they do.

Paul we wish you much hope in letting your physical body heal after exposing yourself to such a spray.

We end with a new vision of the future. Where man works with nature. Where Eco systems are left to thrive with biodiversity. Where families can exit their homes and breath pure air and drink pure water. A day when State agencies protect the environment that we all call home.
 Dan/Maya Gee

P.S. If you do actually have any photos of our valley side during the spray application; please feel free to share them with us.

On Fri, Mar 6, 2009 at 11:31 AM, CLEMENTS Paul R <Paul.R.Clements@state.or.us> wrote:
 Dan -

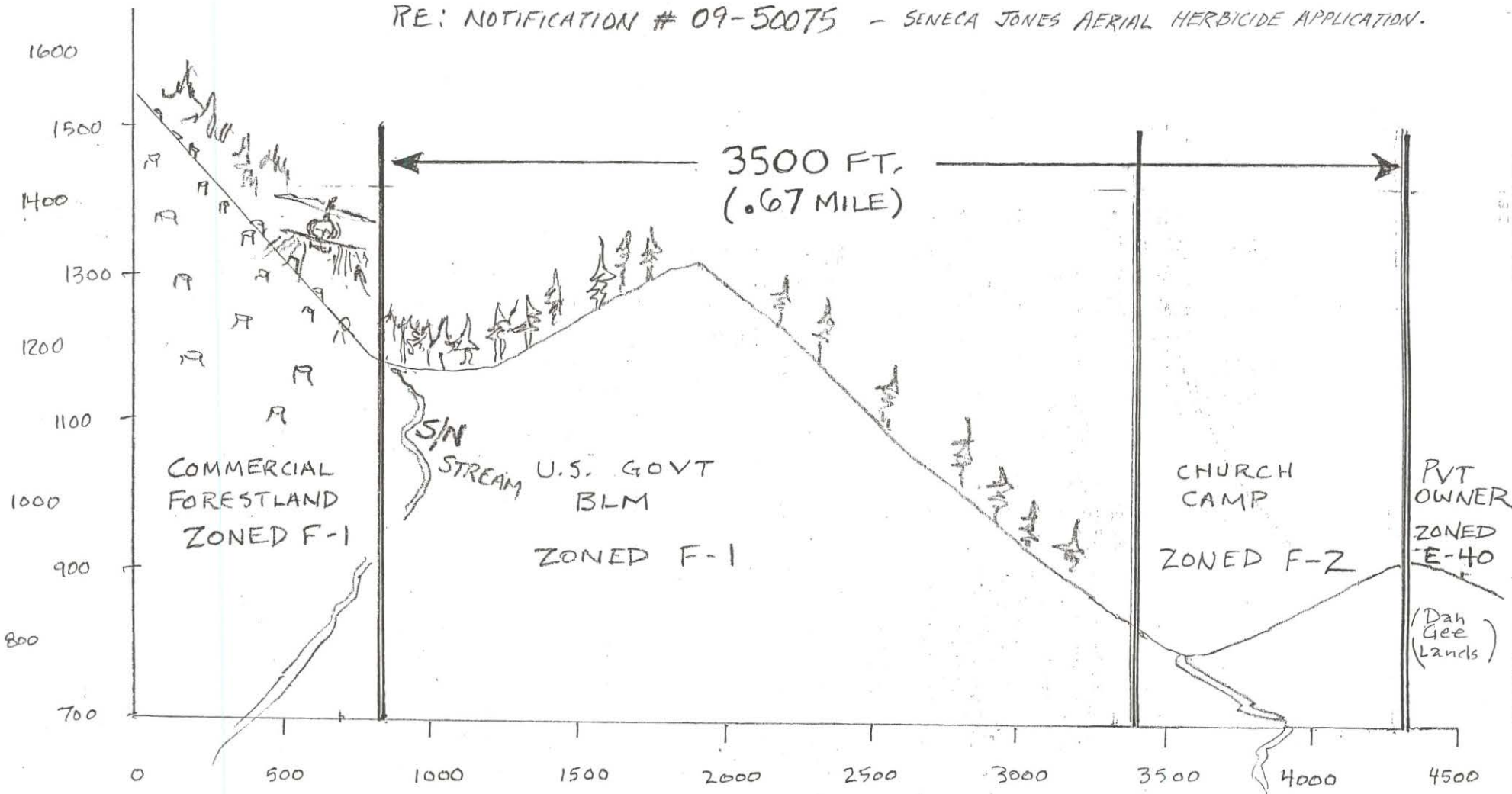
By way of electronic mail you should have now recieved all of the sixteen digital camera jpg files I took of Seneca Jones herbicide application.

Paul Clements

Paul Clements
 Stewardship Forester
 Oregon Department of Forestry
 Western Lane District
 PO Box 157
 Veneta, OR 97487 - 0157
 phone # (541) 935 -2283
 fax # (541) 935-0731

email : pclements@odf.state.or.us

RE: NOTIFICATION # 09-50075 - SENECA JONES AERIAL HERBICIDE APPLICATION.



PROFILE OF TERRAIN 6/10 MILE NORTH OF "FISH CREEK NORTH" UNIT

SITE OF MARCH 4, 2009 AERIAL HERBICIDE APPLICATION.

re: concerns for off-site application -

HORIZONTAL 1" = 500'
VERTICAL 1" = 200'

from USGS TOPO MAP & ODF 'FANS' TAX LOT LAYER

ODF -
WESTERN LAKE DISTRICT

P. Clemons - Stewardship Forest



DAILY SPRAY REPORT

OREGON DEPARTMENT OF TRANSPORTATION

DATE:

6/14/2010

HIGHWAY No	MP	2	TO	16.4	SPRAY WIDTH	20 feet	NON-ROADWAY SITE DESCRIPTN	CREW NO:	2520	BRIDGE CREW, DIST 5	22573
229	MP		TO		TOTAL SHLDR SPRAYED	14.40 miles		COUNTY:	Lane		
MAPLETON-JUNCTION CITY	MP		TO		AREA SPRAYED	*0.04 acre 0.02 hectare		EA/SUBJOB:	M1204474011		
MAT. CODE	PRODUCT USED	CHEMICAL NAMES		EPA No	RATE / ACRE	RATE / 100gal	TOTAL QUANTITY (undiluted quantity)	TOTAL QUANTITY (metric)			
0	Milestone VM Plus	2.22% Aminopyralid 16.22% triclopyr		62719-572	128		5.2 oz	153.8 mL			

LIST OF ADDITIVES AND APPLICATION RATES:

PHASE @ 16 OZ ACRE

TYPE OF CARRIER:

Water

ESTIMATED AMOUNT OF CARRIER PER ACRE:

50 gallons

SITE TREATED:	ROAD SITES (CHECK THOSE THAT APPLY)	SITE DESCRIPTION:	PESTS:	NOXIOUS WEEDS:
<input checked="" type="checkbox"/> ROAD <input type="checkbox"/> INDOOR-OFFICE <input type="checkbox"/> INDOOR-PARK <input type="checkbox"/> OUTDOOR-OFFICE <input type="checkbox"/> OUTDOOR-PARK <input type="checkbox"/> OTHER	<input type="checkbox"/> SHOULDER <input type="checkbox"/> MEDIAN <input checked="" type="checkbox"/> DITCH <input checked="" type="checkbox"/> CULVERTS	<input checked="" type="checkbox"/> BRUSH <input type="checkbox"/> SIGN POST <input type="checkbox"/> LAWNS <input type="checkbox"/> SHRUB BED	<input checked="" type="checkbox"/> WEEDS <input type="checkbox"/> INSECTS <input type="checkbox"/> RODENTS <input type="checkbox"/> GROWTH REGULATOR <input type="checkbox"/> OTHER Weed control	<input type="checkbox"/> LIST "T" <input type="checkbox"/> LIST "A" <input type="checkbox"/> LIST "B"

TYPE OF PESTS SPRAYED:

BLACKBERRIES AND POISON OAK

SPRAY TIME:	9:00 AM	TO	11:00 AM	TYPE APPLICATION:	Backpack sprayer (spot)
TEMPERATURE:	58	TO	59 F	SPRAYER EQUIPMENT NUMBER:	020239
WEATHER CONDITIONS:	Clear			SPRAY PRESSURE:	20 psi
WIND CONDITIONS:	Calm				

COMMENTS: APPLICATIONS AROUND BRIDGE ENDS

Error notes:

☒ Dispatch Contacted Contact Date and Time 6/14/2010 7:30:00 AM



DAILY SPRAY REPORT

OREGON DEPARTMENT OF TRANSPORTATION

DATE:

6/14/2010

HIGHWAY No	MP	47	TO	51.5	SPRAY WIDTH	20 feet	NON-ROADWAY SITE DESCRIPTN	CREW NO:	2520	BRIDGE CREW, DIST 5	22572
229	MP		TO		TOTAL SHLDR SPRAYED	4.50 miles		COUNTY:	Lane		
MAPLETON-JUNCTION CITY	MP		TO		AREA SPRAYED	*0.08 acre 0.03 hectare		EAT SUBJOB:	M1204476011		
MAT. CODE	PRODUCT USED	CHEMICAL NAMES		EPA No	RATE / ACRE	RATE / 100gal	TOTAL QUANTITY (undiluted quantity)	TOTAL QUANTITY (metric)			
0	Milestone VM Plus	2.22% Aminopyralid 16.22% triclopyr		62719-572	128		10.4 oz	307.6 mL			

LIST OF ADDITIVES AND APPLICATION RATES:

PHASE @ 16 OZ ACRE

TYPE OF CARRIER:

Water

ESTIMATED AMOUNT OF CARRIER PER ACRE:

50 gallons

SITE TREATED:	ROAD SITES (CHECK THOSE THAT APPLY)	SITE DESCRIPTION:
<input checked="" type="checkbox"/> ROAD	<input type="checkbox"/> SHOULDER	<input checked="" type="checkbox"/> BRUSH
<input type="checkbox"/> INDOOR-OFFICE	<input type="checkbox"/> MEDIAN	<input type="checkbox"/> SIGN POST
<input type="checkbox"/> INDOOR-PARK	<input checked="" type="checkbox"/> DITCH	<input type="checkbox"/> LAWNS
<input type="checkbox"/> OUTDOOR-OFFICE	<input checked="" type="checkbox"/> CULVERTS	<input type="checkbox"/> SHRUB BED
<input type="checkbox"/> OUTDOOR-PARK		
<input type="checkbox"/> OTHER		

TYPE OF PESTS SPRAYED:

BLACKBERRIES AND POISON OAK

PESTS:	NOXIOUS WEEDS:
<input checked="" type="checkbox"/> WEEDS	<input type="checkbox"/> LIST "T"
<input type="checkbox"/> INSECTS	<input type="checkbox"/> LIST "A"
<input type="checkbox"/> RODENTS	<input type="checkbox"/> LIST "B"
<input type="checkbox"/> GROWTH REGULATOR	
<input type="checkbox"/> OTHER Weed control	

SPRAY TIME:

11:30 AM TO 4:00 PM

TYPE APPLICATION:

Backpack sprayer (spot)

TEMPERATURE:

65 TO 70 F

SPRAYER EQUIPMENT NUMBER:

020239

WEATHER CONDITIONS:

Clear

SPRAY PRESSURE:

20 psi

WIND

CONDITIONS:

Calm

COMMENTS: APPLICATIONS TO BRIDGE ENDS

Error notes:

☒ Dispatch Contacted

Contact Date and Time

6/14/2010 7:30:00 AM



DAILY SPRAY REPORT

OREGON DEPARTMENT OF TRANSPORTATION

DATE: 6/14/2010

HIGHWAY No	MP	39	TO	28.65	SPRAY WIDTH	20 feet	NON-ROADWAY SITE DESCRIPTN	CREW NO:	2503	VENETA SECTION
229	MP		TO		TOTAL SHLDR SPRAYED	10.35 miles		COUNTY:	Lane	
MAPLETON-JUNCTION CITY	MP		TO		AREA SPRAYED	*0.30 acre 0.12 hectare		EA/ SUBJOB:	M1204476011	

MAT. CODE	PRODUCT USED	CHEMICAL NAMES	EPA No	RATE / ACRE	RATE / 100gal	TOTAL QUANTITY (undiluted quantity)	TOTAL QUANTITY (metric)
0	Milestone VM Plus	2.22% Aminopyralid 16.22% triclopyr	62719-572	128		38 OZ	1124 mL

LIST OF ADDITIVES AND APPLICATION RATES:
PHASE @ 32 OZ ACRE

TYPE OF CARRIER:

Water

ESTIMATED AMOUNT OF
 CARRIER PER ACRE:

100 gallons

SITE TREATED: ☒ ROAD → ROAD SITES (CHECK THOSE THAT APPLY) SITE DESCRIPTION:

<input type="checkbox"/> INDOOR-OFFICE	<input checked="" type="checkbox"/> SHOULDER	<input type="checkbox"/> BRUSH
<input type="checkbox"/> INDOOR-PARK	<input type="checkbox"/> MEDIAN	<input type="checkbox"/> SIGN POST
<input type="checkbox"/> OUTDOOR-OFFICE	<input type="checkbox"/> DITCH	<input type="checkbox"/> LAWNS
<input type="checkbox"/> OUTDOOR-PARK	<input type="checkbox"/> CULVERTS	<input type="checkbox"/> SHRUB BED
<input type="checkbox"/> OTHER		

TYPE OF PESTS
 SPRAYED:

Meadow knapweed

PESTS: ☒ WEEDS → NOXIOUS WEEDS:

<input type="checkbox"/> INSECTS	<input type="checkbox"/> LIST "T"
<input type="checkbox"/> RODENTS	<input type="checkbox"/> LIST "A"
<input type="checkbox"/> GROWTH REGULATOR	<input type="checkbox"/> LIST "B"
<input type="checkbox"/> OTHER	Weed control

SPRAY TIME: 9:00 AM TO 12:30 PM TYPE APPLICATION: Handgun (Hose-end)

TEMPERATURE: 55 TO 64 F SPRAYER EQUIPMENT NUMBER: 010265

WEATHER CONDITIONS: Clear SPRAY PRESSURE: 30 psi

WIND CONDITIONS: Light (1-4 mph)

COMMENTS: SPOT SPRAY Knapweed

Error notes:

☒ Dispatch Contacted Contact Date and Time 6/14/2010 7:00:00 AM



DAILY SPRAY REPORT

OREGON DEPARTMENT OF TRANSPORTATION

DATE:

6/15/2010

HIGHWAY No	MP	47.67	TO	51.5	SPRAY WIDTH	20 feet	NON-ROADWAY SITE DESCRIPTN	CREW NO:	2503	VENETA SECTION	22576
229	MP		TO		TOTAL SHLDR SPRAYED	3.83 miles		COUNTY:	Lane		
MAPLETON-JUNCTION CITY	MP		TO		AREA SPRAYED	*0.10 acre 0.04 hectare		EA/ SUBJOB:	M1204476011		

MAT. CODE	PRODUCT USED	CHEMICAL NAMES	EPA No	RATE / ACRE	RATE / 100gal	TOTAL QUANTITY (undiluted quantity)	TOTAL QUANTITY (metric)
0	Milestone VM Plus	2.22% Aminopyralid 16.22% triclopyr	62719-572	128		13 OZ	384.5 mL

LIST OF ADDITIVES AND APPLICATION RATES:

PHASE @32 OZ ACRE

TYPE OF CARRIER:

Water

ESTIMATED AMOUNT OF CARRIER PER ACRE:

100 gallons

SITE TREATED:

- ☒ ROAD
☐ INDOOR-OFFICE
☐ INDOOR-PARK
☐ OUTDOOR-OFFICE
☐ OUTDOOR-PARK
☐ OTHER

ROAD SITES (CHECK THOSE THAT APPLY) SITE DESCRIPTION:

- ☒ SHOULDER
☐ MEDIAN
☐ DITCH
☐ CULVERTS
☐ BRUSH
☐ SIGN POST
☐ LAWNS
☐ SHRUB BED

PESTS:

- ☒ WEEDS
☐ INSECTS
☐ RODENTS
☐ GROWTH REGULATOR
☐ OTHER Weed control

NOXIOUS WEEDS:

- ☐ LIST "T"
☐ LIST "A"
☐ LIST "B"

TYPE OF PESTS SPRAYED:

Meadow knapweed

SPRAY TIME:

10:00 AM TO 11:30 AM

TYPE APPLICATION:

Handgun (Hose-end)

TEMPERATURE:

55 TO 57 F

SPRAYER EQUIPMENT NUMBER:

010265

WEATHER CONDITIONS:

Partly cloudy

SPRAY PRESSURE:

30 psi

WIND CONDITIONS:

Calm

COMMENTS: SPOT SPRAY KNAPWEED

Error notes:

☒ Dispatch Contacted Contact Date and Time

6/15/2010 8:45:00 AM



DAILY SPRAY REPORT

OREGON DEPARTMENT OF TRANSPORTATION

DATE: 6/15/2010

HIGHWAY No	MP	35	TO	45.5	SPRAY WIDTH	20 feet	NON-ROADWAY SITE DESCRIPTN	CREW NO:	2520	BRIDGE CREW, DIST 5	22574
229	MP		TO		TOTAL SHLDR SPRAYED	10.50 miles		COUNTY:	Lane		
MAPLETON-JUNCTION CITY	MP		TO		AREA SPRAYED	*0.04 acre 0.02 hectare		EA/SUBJOB:	M1204476011		

MAT. CODE	PRODUCT USED	CHEMICAL NAMES	EPA No	RATE / ACRE	RATE / 100gal	TOTAL QUANTITY (undiluted quantity)	TOTAL QUANTITY (metric)
0	Milestone VM Plus	2.22% Aminopyralid 16.22% triclopyr	62719-572	128		5.2 OZ	153.8 mL

LIST OF ADDITIVES AND APPLICATION RATES:
PHASE @ 16 OZ ACRE

TYPE OF CARRIER: **Water**

ESTIMATED AMOUNT OF CARRIER PER ACRE: **50 gallons**

SITE TREATED: ☒ ROAD ☐ INDOOR-OFFICE ☐ INDOOR-PARK ☐ OUTDOOR-OFFICE ☐ OUTDOOR-PARK ☐ OTHER

ROAD SITES (CHECK THOSE THAT APPLY): ☐ SHOULDER ☐ MEDIAN ☒ DITCH ☒ CULVERTS ☒ BRUSH ☐ SIGN POST ☐ LAWNS ☐ SHRUB BED

SITE DESCRIPTION:

PESTS: ☒ WEEDS ☐ INSECTS ☐ RODENTS ☐ GROWTH REGULATOR ☐ OTHER **Weed control**

NOXIOUS WEEDS: ☐ LIST "T" ☐ LIST "A" ☐ LIST "B"

TYPE OF PESTS SPRAYED:

BLACKBERRIES AND POISON OAK

SPRAY TIME: **1:30 PM** TO **3:30 PM** TYPE APPLICATION: **Backpack sprayer (spot)**

TEMPERATURE: **56** TO **61** F SPRAYER EQUIPMENT NUMBER: **020239**

WEATHER CONDITIONS: **Partly cloudy** SPRAY PRESSURE: **20 psi**

WIND CONDITIONS: **Calm**

COMMENTS: **APPLICATIONS AROUND BRIDGE ENDS**

Error notes:

☒ Dispatch Contacted Contact Date and Time 6/15/2010 8:45:00 PM

Specimen Label:

Dow AgroSciences Milestone VM Plus

EPA Reg. No. 62719-572

Specimen Label



Milestone[®] VM Plus

Specialty Herbicide

®Trademark of Dow AgroSciences LLC

For control of herbaceous broadleaf weeds and woody plants in rangeland, permanent grass pastures, Conservation Reserve Program (CRP), and on non-cropland areas including industrial sites, rights-of-way (such as roadsides, electric utility and communication transmission and distribution lines, pipelines, and railroads), fencerows, non-irrigation ditch banks, natural areas (such as wildlife management areas, wildlife openings, wildlife habitats, recreation areas, campgrounds, trailheads and trails), and grazed areas in and around these sites.

Use within sites listed above may include applications to seasonably dry wetlands (including flood plains, marshes, swamps, or bogs) and around standing water on sites such as deltas and riparian areas.

Not For Sale, Distribution, or Use in New York State.

GROUP	4	HERBICIDE
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Active Ingredient:

Triisopropanolammonium salt of 2-pyridine carboxylic acid, 4-amino-3,6-dichloro-	2.22%
Triethylamine salt of [(3,5,6-trichloro-2- pyridinyl)oxy] acetic acid)	16.22%
Other Ingredients	81.56%
Total	100.0%

Acid Equivalents:

aminopyralid (2-pyridine carboxylic acid, 4-amino-3,6-dichloro-) – 1.15% (0.1 lb/gal)
triclopyr (3,5,6-trichloro-2-pyridinyloxyacetic acid) – 11.63% (1 lb/gal)

EPA Reg. No. 62719-572

Keep Out of Reach of Children

CAUTION

Precautionary Statements

Hazard to Humans and Domestic Animals

Harmful if Swallowed • Causes Moderate Eye Irritation

Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, or using tobacco. Avoid contact with eyes, skin or clothing.

Personal Protective Equipment (PPE)

Some of the materials that are chemical-resistant to this product are listed below. If you want more options, follow the instructions for category C on an EPA chemical-resistance category selection chart.

Applicators and other handlers must wear:

- Long-sleeved shirt and long pants
- Shoes plus socks
- Chemical resistant gloves (≥ 14 mils) such as butyl rubber, natural rubber, neoprene rubber or nitrile rubber

Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry.

Engineering Controls

When handlers use closed systems, enclosed cabs, or aircraft in a manner that meets the requirements listed in the WPS (40 CFR 170.240(d)(4-6), the handler PPE requirements may be reduced or modified as specified in the WPS.

User Safety Recommendations

Users should:

- Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.
- Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

First Aid

If swallowed: Call a poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by a poison control center or doctor. Do not give anything by mouth to an unconscious person.
If in eyes: Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing. Call a poison control center or doctor for treatment advice.

Have the product container or label with you when calling a poison control center or doctor or going for treatment. You may also contact 1-800-992-5994 for emergency medical treatment information.

Environmental Hazards

Do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment washwater or rinsate.

This chemical has properties and characteristics associated with chemicals detected in groundwater. The use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in groundwater contamination.

Notice: Read the entire label. Use only according to label directions. **Before using this product, read Warranty Disclaimer, Inherent Risks of Use, and Limitation of Remedies elsewhere on this label. If terms are unacceptable, return at once unopened.**

In case of emergency endangering health or the environment involving this product, call 1-800-992-5994. If you wish to obtain additional product information, visit our web site at www.dowagro.com.

Agricultural Chemical: Do not ship or store with food, feeds, drugs or clothing.

Directions for Use

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

Read all Directions for Use carefully before applying.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation.

Not For Sale, Distribution, or Use in New York State.

Entry Restrictions: For applications on non-cropland areas, do not enter or allow others to enter the treated area until sprays have dried.

Agricultural Use Requirements

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE), and restricted-entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do not enter or allow worker entry into treated areas during the restricted entry interval (REI) of 48 hours.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is:

- Coveralls
- Shoes plus socks
- Protective eyewear
- Chemical-resistant gloves (≥ 14 mils) such as butyl rubber, natural rubber, neoprene rubber or nitrile rubber

Non-Agricultural Use Requirements

The requirements in this box apply to uses of this product that are NOT within the scope of the Worker Protection Standard for Agricultural Pesticides (40 CFR Part 170). The WPS does not pertain to non-agricultural use on sites, such as, rangeland, permanent grass pastures, or non-cropland. See the Agricultural Use Requirements section for information where the WPS applies.

Entry Restrictions for Non-WPS Uses: For applications on rangeland and permanent grass pastures (not harvested for hay) and non-cropland areas, do not allow entry into areas until sprays have dried, unless applicator and other handler PPE is worn.

Storage and Disposal

Do not contaminate water, food, feed or fertilizer by storage or disposal. Open dumping is prohibited.

Pesticide Storage: If this product is exposed to subfreezing temperatures, the active ingredient may crystallize and settle out of solution. Under these conditions the product should be warmed to at least 40°F and agitated well to dissolve any crystallized active ingredient prior to use.

Pesticide Disposal: Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.

Nonrefillable containers 5 gallons or less:

Container Reuse: Nonrefillable container. Do not reuse or refill this container. Offer for recycling if available.

Triple rinse or pressure rinse container (or equivalent) promptly after emptying. **Triple rinse** as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. **Pressure rinse** as follows: Empty the remaining contents into application equipment or a mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container, and rinse at about 40 psi for at least 30 seconds. Drain for 10 seconds after the flow begins to drip.

Refillable containers larger than 5 gallons:

Container Reuse: Refillable container. Refill this container with pesticide only. Do not reuse this container for any other purpose. Cleaning the container before final disposal is the responsibility of the person disposing of the container. Cleaning before refilling is the responsibility of the refiller. To clean the container before final disposal, empty the remaining contents from this container into application equipment or a mix tank. Fill the container about 10% full with water and, if possible, spray all sides while adding water. If practical, agitate vigorously or recirculate water with the pump for two minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times.

Storage and Disposal (Cont.)

Nonrefillable containers larger than 5 gallons:

Container Reuse: Nonrefillable container. Do not reuse or refill this container. Offer for recycling if available.

Triple rinse or pressure rinse container (or equivalent) promptly after emptying. **Triple rinse** as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container 1/4 full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times.

Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times.

Pressure rinse as follows: Empty the remaining contents into application equipment or a mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container, and rinse at about 40 psi for at least 30 seconds. Drain for 10 seconds after the flow begins to drip.

Resistance Management Guidelines

- Development of plant populations tolerant to auxiliary growth regulator mode-of-action is usually not a problem on non-cropland sites because these sites receive infrequent pesticide applications.
- Similar looking biotypes of a given weed species occurring in a treated area may vary in their susceptibility to a herbicide. Application of a herbicide below its labeled rate may allow more tolerant weeds to survive and a shift to more tolerant biotypes within the treated area.
- Where identified, spreading of resistant weeds to other fields may be prevented by cleaning harvesting and tillage equipment before moving to other areas and by planting weed-free seed.
- Contact your extension specialist, certified crop consultant, or Dow AgroSciences representative for the latest resistance management information.

Non-Cropland Areas and Industrial Non-Crop Areas

Milestone VM Plus specialty herbicide controls broadleaf weeds, including invasive and noxious weeds on non-cropland areas including industrial sites, rights-of-way (including roadsides, electric utility and communication transmission and distribution lines, pipelines, and railroads), non-irrigation ditch banks, natural areas (including wildlife management areas, wildlife openings, wildlife habitats, recreation areas, campgrounds, trailheads and trails), and grazed areas in and around these sites without injury to most grasses.

Use within sites listed above may include applications to seasonably dry wetlands (including flood plains, marshes, swamps, or bogs) and around standing water on sites such as deltas and riparian areas.

Use Precautions and Restrictions

- It is permissible to treat non-irrigation ditch banks, seasonably dry wetlands (such as flood plains, deltas, marshes, swamps, or bogs) and transitional areas between upland and lowland sites only when dry.
- Minimize overspray to open water when treating target vegetation in and around non-flowing, quiescent or transient water. When making applications to control unwanted plants on banks or shorelines of flowing water, minimize overspray to open water. **Note:** Consult local public water control authorities before applying this product in and around public water. Permits may be required to treat such areas.
- **Avoiding Injury to Non-Target Plants:** Do not aerially apply Milestone VM Plus within 50 feet of a border downwind (in direction of wind movement), or allow spray drift to come in contact with, any broadleaf crop or other desirable broadleaf plants, including, but not limited to, alfalfa, cotton, dry beans, flowers, grapes, lettuce, potatoes, radishes, soybeans, sugar beets, sunflowers, tobacco, tomatoes or other broadleaf or vegetable crop, fruit trees, ornamental plants, or soil where sensitive crops are growing or will be planted. Avoid application under conditions that may allow spray drift because very small quantities of spray may seriously injure susceptible crops. Follow Precautions for Avoiding Spray Drift and Spray Drift Advisory under General Mixing and Application Instructions to minimize the potential for spray drift.
- **Milestone VM Plus is highly active against many broadleaf plant species.** Do not use this product on areas where loss of desirable broadleaf plants, including legumes, cannot be tolerated.
- **Chemigation:** Do not apply this product through any type of irrigation system.
- **Do not contaminate water intended for irrigation or domestic purposes.** Do not treat inside banks or bottoms of irrigation ditches, either dry or containing water, or other channels that carry water that may be used for irrigation or domestic purposes.
- Untreated trees can occasionally be affected by root uptake of Milestone VM Plus through movement into the soil or by excretion of the product from the roots of nearby treated trees. Do not apply Milestone VM Plus within the root zone of desirable trees.
- **Crop Rotation:** Do not rotate non-cropland to cropland for one year following an application of Milestone VM Plus. Do not plant a broadleaf crop until an adequately sensitive field bioassay shows that the level of aminopyralid present in the soil will not adversely affect that broadleaf crop.
- **Seeding Legumes or Wildflowers:** Do not plant legumes or wildflowers until a soil bioassay has been conducted to determine if residues of Milestone VM Plus remaining in the soil will adversely affect establishment of legumes and wildflowers.
- **Field Bioassay Instructions:** In a representative section of an area previously treated with this product, plant short test rows of the intended species across the original direction of application in a manner to sample variability in field conditions such as soil texture, soil organic matter, soil pH, rainfall pattern or drainage. The field bioassay can be initiated at any time after application and before the planting of the intended species. Observe the seeded species for symptoms of herbicidal activity, such as poor stand (effect on seed germination), chlorosis (yellowing), necrosis (dead leaves or shoots), or stunting (reduced growth). If herbicidal symptoms do not occur, the intended seeded species may be planted. If herbicidal activity is observed, do not plant the field to the intended seeded species.

- **Milestone VM Plus in Plant Residues or Manure:**
 - ◆ Do not use Milestone VM Plus-treated plant residues, including hay or straw from treated areas, or manure from animals that have grazed forage or eaten hay harvested from treated areas within the previous 3 days as compost or mulch that will be applied to areas where susceptible broadleaf plants may be grown.
 - ◆ Do not spread manure from animals that have grazed or consumed forage or hay from treated areas within the previous 3 days on land used for growing susceptible broadleaf crops.
 - ◆ Manure from animals that have grazed forage or hay harvested from Milestone VM Plus-treated areas within the previous 3 days may only be spread on pasture grasses, grass grown for seed, and wheat.
 - ◆ Do not plant a broadleaf crop in fields treated in the previous year with manure from animals that have grazed forage or hay harvested from Milestone VM Plus-treated areas until an adequately sensitive field bioassay is conducted to determine that the Milestone VM Plus residues in the soil is at a level that is not injurious to the crop to be planted.
 - ◆ To promote herbicide decomposition, plant residues should be evenly incorporated in the surface soil or burned. Breakdown of Milestone VM Plus in plant residues or manure is more rapid under warm, moist soil conditions and may be accelerated by supplemental irrigation.
- **Grazing and Haying Restrictions:** There are no restrictions on grazing or hay harvest following application of Milestone VM Plus at labeled rates. Do not transfer grazing animals from areas treated with Milestone VM Plus to areas where sensitive broadleaf crops occur without first allowing 3 days of grazing on an untreated pasture. Otherwise, urine and manure may contain enough Milestone VM Plus to cause injury to broadleaf plants.
- **Maximum Application Rate:** On non-cropland areas, do not apply more than 9 pints per acre of Milestone VM Plus (0.11 lb acid equivalent aminopyralid and 1.12 lb acid equivalent triclopyr) per year. The total amount of Milestone VM Plus applied broadcast, as a re-treatment, and/or spot treatment per year, must not exceed 9 pints per acre. If products containing the same active ingredient are tank mixed, do not exceed the maximum allowable active ingredient rate per acre per application per year.

Application Methods

(Broadcast Equipment)

Ground Broadcast Application: Apply the labeled rate of Milestone VM Plus as a coarse low-pressure spray. Spray volume should be sufficient to uniformly cover foliage. Higher volumes (greater than 10 gallons per acre) generally provide better coverage and better control, particularly in dense and/or tall foliage canopies situations. To enhance foliage wetting and coverage, an approved non-ionic agricultural surfactant may be added to the spray mixture as recommended by the surfactant manufacturer.

Do not apply this product with mist blower systems that deliver very fine spray droplets. Use of mist blower equipment can reduce weed control and increase spray drift potential.

Aerial Broadcast Application: Apply the labeled rate of Milestone VM Plus as a coarse low-pressure spray. Spray volume should be sufficient to uniformly cover foliage. Increase spray volume to ensure thorough and uniform coverage when target vegetation is tall and/or dense. Spray volumes greater than 2 gallons per acre generally provide better coverage and better control, particularly when the foliage canopy is dense and/or tall. To enhance foliage wetting and coverage, an approved non-ionic agricultural surfactant may be added to the spray mixture as recommended by the surfactant manufacturer. Also see Precautions for Avoiding spray Drift and Aerial Spray Drift Advisory.

(Hand-Held Equipment)

High-Volume Foliar Application: High volume foliar applications may be applied at rates equivalent to the broadcast-applied rate up to a maximum of 9 pints per acre per annual growing season. Use sufficient spray volume to thoroughly and uniformly wet foliage and stems. To ensure thorough wetting of high volume treatments, a high quality non-ionic agricultural surfactant such as a non-ionic or methylated seed oil may be added to the spray mixture as recommended by the surfactant manufacturer. Multiple applications may be made, but the total amount of Milestone VM Plus applied must not exceed 9 pints per acre per year.

Low Volume Foliage Treatment

To control susceptible woody plants, apply up to 9 pints of Milestone VM Plus in 10 to 100 gallons of finished spray depending on plant density. The spray concentration of Milestone VM Plus and total spray volume per acre should be adjusted according to the size and density of target woody plants and kind of spray equipment used. With low volume sprays, use sufficient spray volume to obtain uniform coverage of target plants including the surfaces of all foliage, stems, and root collars (see General Use Precautions and Restrictions). For best results, a surfactant such as a non-ionic or methylated seed oil should be added to all spray mixtures. Match equipment and delivery rate of spray nozzles to height and density of woody plants. When treating tall, dense brush, a hose and spray gun with spray tips that deliver up to 2 gallons per minute at 40 to 60 psi may be required. Backpack or other types of specialized spray equipment with spray tips that deliver less than 1 gallon of spray per minute may be appropriate for short, low to moderate density brush.

Spot Application: Spot applications may be made at rates equivalent to the broadcast-applied rate of 4 to a maximum of 9 pints per acre per annual growing season. Spray volume should be sufficient to thoroughly and uniformly wet weed foliage. Use of a high quality non-ionic agricultural surfactant may be added to the spray mixture as recommended by the surfactant manufacturer. Repeat treatments may be made, but the total amount of Milestone VM Plus applied must not exceed 9 pints per acre per year. To prevent misapplication, spot treatments should be applied with a calibrated boom, boomless spray system, hand-held, or backpack sprayers.

Spot applications may be made at a rate of up to 0.22 lb acid equivalent aminopyralid (9 quarts of Milestone VM Plus) per acre; however, not more than 50% of an acre may be treated. Do not apply more than a total of 0.11 lb acid equivalent aminopyralid per acre (9 pints per acre of Milestone VM Plus) per annual growing season as a result of broadcast, spot or repeat applications.

Aerial Application

Aerial sprays should be applied using suitable drift control. (See Precautions for Avoiding Spray Drift and Aerial Drift Reduction Advisory). Add an agriculturally labeled non-ionic surfactant.

Herbaceous Broadleaf Weed and Woody Plant Control

Rangeland, Permanent Grass Pastures and CRP Acres

Milestone VM Plus may be applied to rangeland, permanent pasture or CRP acres seeded to permanent grasses as an aerial or ground broadcast treatment, as a spot application, or as a high or low volume foliar application (see Application Methods section) to control susceptible broadleaf weeds, including invasive and noxious weeds (see Broadleaf Weeds Controlled section). Milestone VM Plus may be applied alone or in tank mix combinations with labeled rates of other herbicides provided that: (1) the tank mix product is labeled for the timing and method of application for the use site to be treated and (2) tank mixing is not prohibited by the label of the registered tank mixed products. When tank mixing, follow the use directions on the labeling of each tank mix partner. Follow Mixing Instructions under the General Mixing and Application Instructions section.

Do not use Milestone VM Plus if loss of legumes species or other broadleaf species cannot be tolerated.

During the season of establishment, Milestone VM Plus should be applied only after perennial grasses are well established (have developed a good secondary root system and show good vigor). Most perennial grasses are tolerant to Milestone VM Plus at this stage of development. Only Smooth Brome grass (*Bromus inermis*) has been identified to be suppressed by Milestone VM Plus, this appears to occur under adverse environmental conditions. Plants should recover from this transient suppression with the onset of environmental conditions favorable to grass growth and upon release from weed competition.

Non-Cropland and Industrial Non-Crop Areas

Milestone VM Plus may be applied to non-cropland and industrial non-crop areas as an aerial or ground broadcast application, as a spot application, or as a high volume foliar application (see Application Methods section) to control herbaceous broadleaf weeds and woody plants. Milestone VM Plus may be applied alone or in tank-mix combinations with labeled rates of other herbicides provided: (1) the tank mix product is labeled for the timing and method of application for the use site to be treated and (2) mixing is not prohibited by the label of the registered tank mixed products. Use as directed in the Directions of Use section of the tank-mix partner. Follow Mixing Instructions under the General Mixing and Application Instructions section below.

Cut-Stump Treatment

To control unwanted trees of hardwood species such as elm, maple, oak and conifers, apply Milestone VM Plus, undiluted, by spraying or painting the cut surfaces of freshly cut stumps and stubs as soon as possible after cutting with undiluted Milestone VM Plus. The cambium area next to the bark is the most vital area to wet.

With Tree Injector Method

Apply by injecting 1 milliliter of undiluted Milestone VM Plus through the bark at intervals of 3 to 4 inches between centers of the injector wound. The injections should completely surround the tree at any convenient height. **Note: No Worker Protection Standard worker entry restrictions or worker notification requirements apply when this product is injected directly into plants.**

With Hack and Squirt Method

Make cuts around the tree trunk at a convenient height with a hatchet or similar equipment so that the cuts overlap slightly and make a continuous circle around the trunk. Spray 1 milliliter of undiluted Milestone VM Plus into the pocket created between the bark and the inner stem/trunk by each cut.

With Frill or Girdle Method

Make a single girdle through the bark completely around the tree at a convenient height. The frill should allow for the herbicide to remain next to the inner stem and absorb into the plant. Wet the cut surface with undiluted solution.

Both of the above methods may be used successfully at any season except during periods of heavy sap flow of certain species - for example, maples.

Herbaceous Broadleaf Weed and Woody Plant Management Practices

Milestone VM Plus may be applied postemergence as a broadcast spray or as a spot application to control broadleaf weeds listed on this label; weeds other than those listed may also be controlled by this herbicide. Postemergence applications should be made before bud stage or early flowering, unless otherwise specified. When a rate range is given, use a higher rate in the range to control weeds at advanced growth stages or under less than favorable growing conditions (such as drought stress). Best weed control results are obtained when spray volume is sufficient to provide uniform coverage of treated plants. For optimum uptake and translocation of the herbicide, avoid mowing, haying, shredding, burning or soil disturbance in treated areas for at least 7 days following application.

Milestone VM Plus also provides preemergence control of germinating seeds or emerging seedlings of susceptible broadleaf weeds following application.

Milestone VM Plus can provide long-term control of weeds. The length of control is dependent upon the application rate, condition and growth stage of target weeds, environmental conditions at and following application, and the density and vigor of competing desirable vegetation. Long-term broadleaf weed control is most effective where grasses and other desirable vegetation is allowed to recover from adverse environmental conditions (such as drought) and compete with susceptible broadleaf weeds.

Milestone VM Plus can be an important component of integrated vegetation management programs designed to renovate or restore desired non-cropland plant communities. To maximize and extend the benefits of weed control provided by Milestone VM Plus, it is important that other vegetation management practices, including mowing, fertilization, haying, etc., be used in appropriate sequences and combinations to further alleviate the adverse effects of weeds on desirable plant species and to promote development of desired non-cropland plant communities. Natural resources specialists with federal and state government agencies can provide guidance on best management practices and development of integrated vegetation management programs.

Herbaceous Broadleaf Weeds Controlled

The following weeds will be controlled with the rates of Milestone VM Plus indicated in Table 1 below. For best results, most weeds should be treated when they are actively growing and under conditions favorable for growth. Use a higher rate in the rate range when growing conditions are less than favorable or when weed foliage is tall and dense. Milestone VM Plus also provides preemergence control of germinating seeds and control of emerged seedlings of susceptible broadleaf weeds following application.

Table 1: Broadleaf Weeds Controlled

Common Name (Rate Range 4-6 pints/acre)	
amaranth, spiny	marshelder, annual
bedstraw	mayweed, scentless*
bindweed, field	mayweed, stinking*, **
broomweed, annual	medic, black*
burdock, common*, **	mullein*, **
buttercup, hairy*	ox tongue, bristly
buttercup, tall*, **	plantain
camelthorn**	ragweed, common**
chamomile, scentless*	ragweed, western
chickweed	ragwort, tansy*, **
chicory*	rush skeletonweed*, **
cinquefoil, sulfur (1)*, **	smartweed, Pennsylvania
clover	sneezeweed, bitter
cocklebur	soda apple, tropical (5)*, **
croton, tropic	sowthistle, perennial*, **
cudweed, purple	Spanish needles
daisy, oxeye (1)*, **	St. Johnswort
dandelion, common	star thistle, Malta
dock, curly*	star thistle, purple
evening primrose, cutleaf	star thistle, yellow (6)*, **
fiddleneck, common	sunflower, common
fireweed	teasel*, **
fleabane, flax-leaf	teasel, fuller's*
hawkweed, orange (2)*, **	thistle, artichoke
hawkweed, yellow (2)*, **	thistle, bull (7)*, **
henbit*	thistle, Canada (8)*, **

Common Name (Rate Range 4-6 pints/acre) (Cont.)	
horsenettle, Carolina**	thistle, Italian
horseweed (marestail)	thistle, musk (7)*, **
ironweed, tall	thistle, plumeless (7)*, **
ironweed, western	thistle, woolly distaff*, **
knapweeds*, **	vetch
knapweed, diffuse (3)*, **	wild carrot
knapweed, Russian (4)*, **	wormwood, absinth*, **
knapweed, spotted (3)*, **	yarrow, common
kudzu*, **	

* Invasive plants are introduced species that are indicated to be invasive in the USDA-NRCS, PLANTS Database (<http://plants.usda.gov/index.html>).

** Plants designated as noxious weeds in at least one state (PLANTS Database, USDA-NRCS, <http://plants.usda.gov/index.html>).

- (1) **Sulfur cinquefoil or oxeye daisy:** Apply Milestone VM Plus at 5 to 8 pints per acre to plants in the prebud stage of development.
- (2) **Orange or yellow hawkweeds:** Apply Milestone VM Plus at 5 to 8 pints per acre to plants in the bolting stage of development.
- (3) **Diffuse and spotted knapweeds:** Apply Milestone VM Plus at 6 to 9 pints per acre when plants are actively growing with the optimum time of application occurring from rosette to the bolting stages of development or in the fall.
- (4) **Russian knapweed:** Apply Milestone VM Plus at 5 to 8 pints per acre to plants in the spring and summer that are in the bud to flowering stage and to dormant plants in the fall.
- (5) **Tropical soda apple:** Apply Milestone VM Plus at 6 to 9 pints per acre at any growth stage, but application at flowering will reduce seed production potential.
- (6) **Yellow starthistle:** Apply Milestone VM Plus at 4 to 6 pints per acre to plants at the rosette through bolting growth stages.
- (7) **Bull, musk and plumeless thistles:** Apply Milestone VM Plus at 4 to 6 pints per acre in the spring and early summer to rosette or bolting plants or in the fall to seedlings and rosettes. Apply at 5 to 6 pints when plants are at the late bolt through early flowering growth stages.
- (8) **Canada thistle:** Apply Milestone VM Plus at 6 to 9 pints per acre either in the spring to plants in the prebud growth stage or in the fall to plant regrowth.

Woody Plants Controlled

The following woody plants will be controlled or partially controlled with Milestone VM Plus at 6 to 9 pints/acre. For best results, woody plants should be treated when they are actively growing and under conditions favorable for growth. Use a higher rate with plants listed as Partial Control, when growing conditions are less than favorable, or when weed foliage is tall and dense.

Table 2: Woody Plants Controlled or Partially Controlled

Control

Common Name	
arrowwood	mimosa
aspen	poison ivy
Australian pine	poison oak
blackberry	poplar
ceanothus	redbud
choke cherry	scotch broom
cottonwood	sumac
locust	wild rose
locust, black	wisteria
locust, honey	

Partial Control

Common Name	
Ash	persimmon
bear clover (bearmat)	pine
beech	salt-bush (<i>Baccharis</i> spp.)
birch	salt cedar
blackgum	salmonberry
Brazilian pepper	sassafras
cascara	sweetbay magnolia
chinquapin	sweetgum
Douglas-fir	sycamore
dogwood	tanoak
elderberry	thimbleberry
elm	waxmyrtle
galberry	western hemlock
hazel	willow
hornbeam	winged elmwillow
madrone	winged elm
maples	
Mulberry	
oaks	

Partial control: a sequential application or tank mixes with additional Garlon® 3A, Accord® or other herbicides may be necessary for complete control.

General Mixing and Application Instructions

Mixing Instructions

Mixing with Water: To prepare the spray, add about half the required amount of water in the spray tank. Then, with agitation, add Milestone VM Plus and other registered tank mix herbicides. Finally, with continued agitation, add the rest of the water and additives such as surfactants or drift reduction and deposition aids.

Tank Mixing with Other Herbicides: Milestone VM Plus at rates of up to 9 pints per acre may be mixed with labeled rates of other herbicides registered for application on listed sites to broaden the spectrum of weeds controlled or to improve control of certain weeds. Milestone VM Plus may be applied in tank-mix combination with labeled rates of other herbicides provided: (1) the product tank-mixed with Milestone VM Plus is labeled for the timing and method of application for the use site to be treated; (2) mixing is not prohibited by the label of the product to be tank mixed with Milestone VM Plus; and (3) Milestone VM Plus is compatible with the product to be included in a tank-mix. Use as directed in the Directions for Use section of the tank mix partner.

- For direct injection or other spray equipment where the product formulations will be mixed in undiluted form, special care should be taken to ensure tank mix compatibility (see Tank Mix Compatibility Testing below.)
- Always perform a jar test to ensure the compatibility of products to be used in tank mixture.

Tank-Mix Compatibility Testing: Perform a jar test prior to mixing in a spray tank to ensure compatibility of Milestone VM Plus and other pesticides or carriers. Use a clear glass jar with lid and mix ingredients in the same order and proportions as will be used in the spray tank. The mixture is compatible if the materials mix readily when the jar is inverted several times. The mixture should remain stable after standing for 1/2 hour or, if separation occurs, should readily remix if agitated. An incompatible mixture is indicated by separation into distinct layers that do not readily remix when agitated and/or the presence of flakes, precipitates, gels, or heavy oily film in the jar. Use of an appropriate compatibility aid such as Unite or Complex may resolve mix incompatibility. If the mixture is incompatible do not use that tank mix partner in tank mixtures.

Use with Surfactants: For post-emergence applications, a high quality surfactant such as a non-ionic surfactant of at least 80% active ingredient, should be added at 0.25% to 0.5% by volume (unless otherwise specified) to enhance herbicide activity under adverse environmental conditions (such as, high temperature, low relative humidity, drought conditions, dusty plant surfaces) or when weeds are heavily pubescent or more mature.

Sprayer Clean-Out Instructions

Do not use spray equipment used to apply Milestone VM Plus for other applications to land planted to susceptible crops or desirable sensitive plants unless it has been determined that all residues of this herbicide has been removed by thorough cleaning of equipment.

Equipment used to apply Milestone VM Plus should be thoroughly cleaned before reusing to apply any other chemicals as follows:

- Rinse and flush application equipment thoroughly after use. Dispose of rinse water in non-cropland area away from water supplies.
- Rinse a second time, adding 1 quart of household ammonia or tank cleaning agent for every 25 gallons of water. Circulate the solution through the entire system so that all internal surfaces are contacted (15 to 20 minutes). Let the solution stand for several hours, preferably overnight.
- Flush the solution out of the spray tank through the boom.
- Rinse the system twice with clean water, recirculating and draining each time.
- Spray nozzles and screens should be removed and cleaned separately.

Precautions for Avoiding Spray Drift

Avoid application under conditions that may allow spray drift because very small quantities of spray, which may not be visible, may injure susceptible crops. This product should be applied only when the potential for drift to adjacent sensitive areas (e.g., residential areas, bodies of water, non-target crops and other plants) is minimal (e.g., when wind is blowing away from the sensitive areas. A drift control aid may be added to the spray solution to further reduce the potential for drift. If a drift control aid is used, follow the use directions and precautions on the manufacturer's label. Do not use a thickening agent with Microfoil, Thru-Valve booms, or other spray delivery systems that cannot accommodate thickened spray solutions.

Ground Equipment: With ground equipment spray drift can be lessened by keeping the spray boom as low as possible; by applying 10 gallons or more of spray per acre; by keeping the operating spray pressures at the manufacturer's recommended minimum pressures for the specific nozzle type used (low pressure nozzles are available from spray equipment manufacturers); and by spraying when the wind velocity is low (follow state regulations). Avoid calm conditions which may be conducive to thermal inversions. Direct sprays no higher than the tops of target vegetation and keep spray pressures low enough to provide coarse spray droplets to minimize drift.

Aerial Application: Avoid spray drift at the application site. The interaction of many equipment-and weather-related factors determine the potential for spray drift. Users are responsible for considering all these factors when making decisions.

The following drift management requirements must be followed to avoid off-target drift movement from aerial applications:

1. The distance of the outer most operating nozzles on the boom must not exceed 75% of wingspan or 85% of the rotor diameter.
2. Nozzles should be pointed backward parallel with the air stream or not pointed downwards more than 45 degrees.

Where states have more stringent regulations, they should be observed.

The applicator should be familiar with and take into account the information covered in the following **Aerial Drift Reduction Advisory**. This information is advisory in nature and does not supersede mandatory label requirements.

Aerial Drift Reduction Advisory

Information on Droplet Size: The most effective way to reduce drift potential is to apply large droplets. The best drift management strategy is to apply the largest droplets that provide sufficient coverage and control. Applying larger droplets reduces drift potential, but will not prevent drift if applications are made improperly, or under unfavorable environmental conditions (see Wind, Temperature and Humidity, and Temperature Inversions).

Controlling Droplet Size:

- **Volume** - Use high flow rate nozzles to apply the highest practical spray volume. Nozzles with higher rated flows produce larger droplets.
- **Pressure** - Do not exceed the nozzle manufacturer's recommended pressures. For many nozzle types lower pressure produces larger droplets. When higher flow rates are needed, use higher flow rate nozzles instead of increasing pressure.

- **Number of Nozzles** - Use the minimum number of nozzles that will provide uniform coverage.
- **Nozzle Orientation** - Orient nozzles so that the spray is released parallel to the airstream. This produces larger droplets than other orientations. Significant deflection from horizontal will reduce droplet size and increase drift potential.
- **Nozzle Type** - Use a nozzle type that is designed for the intended application. With most nozzle types, narrower spray angles produce larger droplets. Consider using low-drift nozzles. Solid stream nozzles oriented straight back produce the largest droplets and the lowest drift.

Boom Length: For some use patterns, reducing the effective boom length to less than 75% of wingspan or 85% of the rotor diameter may further reduce drift without reducing swath width.

Application Height: Applications should not be made at a height greater than 10 feet above the top of the largest plants unless a greater height is required for aircraft safety. Making applications at the lowest height that is safe reduces exposure of droplets to evaporation and wind.

Swath Adjustment: When applications are made with a crosswind, the swath will be displaced downwind. Therefore, on the up and downwind edges of the field, the applicator must compensate for this displacement by adjusting the path of the aircraft upwind. Swath adjustment distance should increase, with increasing drift potential (higher wind, smaller drops, etc.).

Wind: Drift potential is lowest between wind speeds of 2 to 10 mph. However, many factors, including droplet size and equipment type determine drift potential at any given speed. Application should be avoided below 2 mph due to variable wind direction and high inversion potential. **Note:** Local terrain can influence wind patterns. Every applicator should be familiar with local wind patterns and how they affect spray drift.

Temperature and Humidity: When making applications in low relative humidity, set up equipment to produce larger droplets to compensate for evaporation. Droplet evaporation is most severe when conditions are both hot and dry.

Temperature Inversions: Applications should not occur during a local, low level temperature inversion because drift potential is high. Temperature inversions restrict vertical air mixing, which causes small suspended droplets to remain in a concentrated cloud. This cloud can move in unpredictable directions due to the light variable winds common during inversions. Temperature inversions are characterized by increasing temperatures with altitude and are common on nights with limited cloud cover and light to no wind. They begin to form as the sun sets and often continue into the morning. Their presence can be indicated by ground fog; however, if fog is not present, inversions can also be identified by the movement of the smoke from a ground source or an aircraft smoke generator. Smoke that layers and moves laterally in a concentrated cloud (under low wind conditions) indicates an inversion, while smoke that moves upward and rapidly dissipates indicates good vertical air mixing.

Terms and Conditions of Use

If terms of the following Warranty Disclaimer, Inherent Risks of Use and Limitation of Remedies are not acceptable, return unopened package at once to the seller for a full refund of purchase price paid. To the extent permitted by law, otherwise, use by the buyer or any other user constitutes acceptance of the terms under Warranty Disclaimer, Inherent Risks of Use and Limitation of Remedies.

Warranty Disclaimer

Dow AgroSciences warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes stated on the label when used in strict accordance with the directions, subject to the inherent risks set forth below. To the extent permitted by law, Dow AgroSciences MAKES NO OTHER EXPRESS OR IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER EXPRESS OR IMPLIED WARRANTY.

Inherent Risks of Use

It is impossible to eliminate all risks associated with use of this product. Crop injury, lack of performance, or other unintended consequences may result because of such factors as use of the product contrary to label instructions (including conditions noted on the label, such as unfavorable temperatures, soil conditions, etc.), abnormal conditions (such as excessive rainfall, drought, tornadoes, hurricanes), presence of other materials, the manner of application, or other factors, all of which are beyond the control of Dow AgroSciences or the seller. To the extent permitted by law, all such risks shall be assumed by buyer.

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1. Refund of purchase price paid by buyer or user for product bought, or
2. Replacement of amount of product used.

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Produced for
Dow AgroSciences LLC
9330 Zionsville Road
Indianapolis, IN 46268

Label Code: D02-886-002
Replaces Label: D02-886-001
LOES Number: 010-02160

EPA accepted 04/19/07

Revisions:

1. Updated Storage and Disposal
2. Addition of the following broadleaf weeds to Table 1: bedstraw, camelthorn, scentless chamomile, chickweed, clover, knapweeds, kudzu, mullein, bristly oxtongue, rush skeletonweed, St. Johnswort, teasel, artichoke thistle, Italian thistle, wooly distaff thistle
3. Addition of the following woody plants to Table 2: blackberry, black locust, honey locust, mimosa, redbud, wisteria

Material Safety Data Sheet:

Dow AgroSciences Milestone VM Plus

EPA Reg. No. 62719-572

MATERIAL SAFETY DATA SHEET



Emergency Phone: 800-992-5994
Dow AgroSciences LLC
Indianapolis, IN 46268

Effective Date: 20-Apr-06
Product Code: 103339
MSDS: 007887

MILESTONE* VM HERBICIDE

1. PRODUCT AND COMPANY IDENTIFICATION:

PRODUCT: Milestone* VM Herbicide

COMPANY IDENTIFICATION:

Dow AgroSciences LLC
9330 Zionsville Road
Indianapolis, IN 46268-1189

2. HAZARDOUS IDENTIFICATIONS:

EMERGENCY OVERVIEW

Brown liquid with a mild odor. May cause temporary eye irritation. May cause skin irritation.

EMERGENCY PHONE NUMBER: 800-992-5994

3. COMPOSITION/INFORMATION ON INGREDIENTS:

Aminopyralid tri-	CAS # 566191-89-7	40.6%
isopropanolammonium		
Balance, Total, Including		59.4%

4. FIRST AID:

EYE: Flush eyes thoroughly with water for several minutes. Remove contact lenses, if present, after the initial 1-2 minutes. If effects occur, consult a physician, preferably an ophthalmologist.

SKIN: Wash skin with plenty of water.

INGESTION: No emergency medical treatment necessary.

INHALATION: Move person to fresh air; if effects occur, consult a physician.

NOTE TO PHYSICIAN: No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient. Have the Safety Data sheet, and if available, the product container or label with you when calling a poison control center or doctor, or going for treatment.

5. FIRE FIGHTING MEASURES:

FLASH POINT: Not applicable (water-based material)

METHOD USED: Not applicable

FLAMMABLE LIMITS

LFL: Not determined

UFL: Not determined

EXTINGUISHING MEDIA: Foam, CO₂, or Dry chemical

FIRE AND EXPLOSION HAZARDS: Foam fire extinguishing system is preferred because uncontrolled water can spread possible contamination. Toxic irritating gases may be formed under fire conditions.

FIRE-FIGHTING EQUIPMENT: Use positive-pressure, self-contained breathing apparatus and full protective equipment.

6. ACCIDENTAL RELEASE MEASURES:

ACTION TO TAKE FOR SPILLS: Absorb small spills with materials such as sand, sawdust, Zorball, or dirt. Wash exposed body areas thoroughly after handling. Report large spills to Dow AgroSciences at 800-992-5994.

7. HANDLING AND STORAGE:

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Keep out of reach of children. Do not swallow. Avoid contact with eyes, skin, and clothing. Avoid breathing vapors and spray mist. Handle concentrate in ventilated area. Wash thoroughly with soap and water after handling and before eating, chewing gum, using tobacco, using the toilet or smoking. Keep away from food, feedstuffs, and water supplies. Store in original container with the lid tightly closed.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION:

These precautions are suggested for conditions where the potential for exposure exists. Emergency conditions may require additional precautions.

EXPOSURE GUIDELINES: None established

ENGINEERING CONTROLS: Good general ventilation should be sufficient for most conditions.

RECOMMENDATIONS FOR MANUFACTURING, COMMERCIAL BLENDING, AND PACKAGING WORKERS:

EYE/FACE PROTECTION: Use safety glasses.

SKIN PROTECTION: Use protective clothing chemically resistant to this material. Selection of specific items such as face shield, boots, apron, or full-body suit will depend on the task.

MATERIAL SAFETY DATA SHEET



Emergency Phone: 800-992-5994
Dow AgroSciences LLC
Indianapolis, IN 46268

Effective Date: 20-Apr-06
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MILESTONE* VM HERBICIDE

HAND PROTECTION: Use gloves chemically resistant to this material. Examples of preferred glove barrier materials include: Polyethylene, Chlorinated polyethylene, and Ethyl vinyl alcohol laminate (EVAL). Examples of acceptable glove barrier materials include: Viton, Butyl rubber, Neoprene, Natural rubber (Latex), Polyvinyl chloride (PVC or Vinyl), Nitrile/butadiene rubber (Nitrile or NBR). Avoid gloves made of: Polyvinyl alcohol (PVA). NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

RESPIRATORY PROTECTION: No respiratory protection should be needed.

APPLICATORS AND ALL OTHER HANDLERS: Refer to the product label for personal protective clothing and equipment.

9. PHYSICAL AND CHEMICAL PROPERTIES:

APPEARANCE: Brown liquid

ODOR: Mild

DENSITY: 1.14 g/mL @ 20°C

pH: 7.33 @ 19.8°C for a 1% solution

FREEZING POINT: <14°F (<-10°C)

10. STABILITY AND REACTIVITY:

STABILITY: (CONDITIONS TO AVOID) Stable under normal storage conditions.

INCOMPATIBILITY: (SPECIFIC MATERIALS TO AVOID)
None known.

HAZARDOUS DECOMPOSITION PRODUCTS: None known.

HAZARDOUS POLYMERIZATION: Not known to occur.

11. TOXICOLOGICAL INFORMATION:

EYE: May cause slight temporary eye irritation. Corneal injury is unlikely.

SKIN: Brief contact may cause slight skin irritation with local redness. Prolonged skin contact is unlikely to result in absorption of harmful amounts. The LD₅₀ for skin absorption in rats is >5000 mg/kg. Did not cause allergic skin reactions when tested in guinea pigs.

INGESTION: Very low toxicity if swallowed. Harmful effects not anticipated from swallowing small amounts. The oral LD₅₀ for rats is >5000 mg/kg.

INHALATION: Prolonged exposure is not expected to cause adverse effects. The aerosol LC₅₀ for rats is >5.79 mg/L in 4 hours.

SYSTEMIC (OTHER TARGET ORGAN) EFFECTS: Based on available data, repeated exposures are not anticipated to cause significant adverse effects.

CANCER INFORMATION: Based largely or completely on information for similar material(s): did not cause cancer in laboratory animals.

TERATOLOGY (BIRTH DEFECTS): Did not cause birth defects or any other fetal effects in laboratory animals.

REPRODUCTIVE EFFECTS: Based largely or completely on information for similar material(s): did not interfere with reproduction in laboratory animal studies.

MUTAGENICITY: In-vitro and animal genetic toxicity studies were negative.

12. ECOLOGICAL INFORMATION:

ENVIRONMENTAL FATE:

MOVEMENT & PARTITIONING:
No relevant information found.

DEGRADATION & PERSISTENCE:
No relevant information found.

ECOTOXICOLOGY:

Material is practically non-toxic to aquatic organisms on an acute basis (LC₅₀ or EC₅₀ is >100 mg/L).

Material is practically non-toxic to fish on an acute basis (LC₅₀ is >100 mg/L).

Material is practically non-toxic to birds on an acute basis (LD₅₀ is >2000 mg/kg).

MATERIAL SAFETY DATA SHEET



Emergency Phone: 800-992-5994
Dow AgroSciences LLC
Indianapolis, IN 46268

Effective Date: 20-Apr-06
Product Code: 103339
MSDS: 007887

MILESTONE* VM HERBICIDE

13. DISPOSAL CONSIDERATIONS:

DISPOSAL METHOD: If wastes and/or containers cannot be disposed of according to the product label directions, disposal of this material must be in accordance with your local or area regulatory authorities.

This information presented below only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations.

If the material as supplied becomes a waste, follow all applicable regional, national and local laws and regulations.

14. TRANSPORT INFORMATION:

U.S. DEPARTMENT OF TRANSPORTATION (DOT) INFORMATION:

For all package sizes and modes of transportation:
This material is not regulated for transport

15. REGULATORY INFORMATION:

NOTICE: The information herein is presented in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ from one location to another; it is the buyer's responsibility to ensure that its activities comply with federal, state or provincial, and local laws. The following specific information is made for the purpose of complying with numerous federal, state or provincial, and local laws and regulations.

U.S. REGULATIONS

SARA 313 INFORMATION: To the best of our knowledge, this product contains no chemical subject to SARA Title III Section 313 supplier notification requirements.

SARA HAZARD CATEGORY: This product has been reviewed according to the EPA "Hazard Categories" promulgated under Section 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:

No real health hazard

TOXIC SUBSTANCES CONTROL ACT (TSCA): All ingredients are on the TSCA inventory or are not required to be listed on the TSCA inventory.

OSHA HAZARD COMMUNICATION STANDARD: This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

STATE RIGHT-TO-KNOW: This product is not known to contain any substances subject to the disclosure requirements of

New Jersey
Pennsylvania

COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY ACT (CERCLA, or SUPERFUND): To the best of our knowledge, this product contains no chemical subject to reporting under CERCLA.

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) RATINGS:

Health	1
Flammability	0
Reactivity	0

16. OTHER INFORMATION:

MSDS STATUS: Revised Sections: 2, 4, 8, 11, 12 & 15
Reference: DR-0368-4864
Replaces RSSDS Dated: 3-Jan-06
Document Code: D03-880-004
Replaces Document Code: D03-880-003

The Information Herein Is Given In Good Faith, But No Warranty, Express or Implied, Is Made. Consult Dow AgroSciences for Further Information.

Specimen Label:

Loveland Products Phase Surfactant

PHASE®

SURFACTANT — ANTIFOAMING AGENT ENHANCES COVERAGE IMPROVES CONTACT

Principal Functioning Agents:

Methylated esters of fatty acids, alcohol ethoxylate,
and polyether modified polysiloxane 100%

TOTAL 100%

Contains an organosilicone surfactant
CA Reg. No. 34704-50037
WA Reg. No. 34704-05007

KEEP OUT OF REACH OF CHILDREN
CAUTION
NET CONTENTS: 2.5 U.S. GALLONS (9.462 L)

Loveland
PRODUCTS INC.
PO Box 1286 • Greeley, CO 80632-1286

C2210

CAUTION: Harmful if inhaled or absorbed through skin. Causes moderate eye irritation. Avoid contact with skin, eyes or clothing. Avoid breathing spray mist. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum or smoking tobacco. Remove and wash contaminated clothing before reuse. **PERSONAL PROTECTIVE EQUIPMENT:** Wear chemical-resistant gloves, long-sleeved shirt and long pants, and shoes plus socks when mixing or applying Phase®.

First Aid: If in Eyes: Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advice. If on Skin or Clothing: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice. If Swallowed: Call a poison control center or doctor immediately for treatment advice. Have the person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by a poison control center or doctor. Do not give anything by mouth to an unconscious person. If Inhaled: Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible. Call a poison control center or doctor for further treatment advice.

FOR A MEDICAL EMERGENCY INVOLVING THIS PRODUCT, CALL 1-866-944-8565.

General: PHASE is a blend of methylated esters of fatty acids and organosilicone surfactant. The organosilicone surfactant enhances the spread of the water portion of a spray solution to yield a more uniform coverage. Methylated esters of fatty acids enhance coverage and contact with foliage of oil components.

Directions for use: PHASE should be utilized with agricultural chemicals and biological controls to improve coverage. In aerial or ground equipment: Fill spray tank 1/2 full with water. Begin agitation, add selected agricultural chemicals in proper sequence. Eliminate any existing foam with approved defoamer (UNFOAMER®). To minimize foam from organosilicone surfactant, fill tank to desired water volume before adding PHASE.

Suggested Use Rate: 1 to 4 pints / 100 gallons

Increase rate of PHASE as spray volume decreases to obtain desired coverage. Some pesticides have stated adjuvant use rates. In all cases the pesticide manufacturer's label should be consulted regarding specific adjuvant use recommendations and that rate followed.

Environmental Hazards: Do not apply directly to water, or to areas where surface water is present, or to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment washwaters. (Not for aquatic use in Washington.)

Storage: Store in cool, dry place. Store in original container. Keep container tightly closed. Do not reuse empty container.

Disposal: Do not contaminate water, food, or feed by storage or disposal. Wastes may be disposed of on-site or at an approved waste disposal facility. Triple rinse (or equivalent), adding rinse water to spray tank. Offer container for recycling or dispose of container in sanitary landfill, or by other procedures approved by appropriate authorities. Recycling decontaminated containers is the best option of container disposal. The Agricultural Container Recycling Council (ACRC) operates the national recycling program. To contact your state and local ACRC recycler visit the ACRC web page at www.acrcycle.org.

For help with any spill, leak, fire or exposure involving this material, call day or night CHEMTREC 1-800-424-9300.

CONDITIONS OF SALE AND LIMITATION OF WARRANTY AND LIABILITY

BEFORE BUYING OR USING THIS PRODUCT, read the entire Directions for Use and the following Conditions of Sale and Limitation of Warranty and Liability. By buying or using this product, the buyer or user accepts the following Conditions of Sale and Limitation of Warranty and Liability, which no employee or agent of LOVELAND PRODUCTS, INC. or the seller is authorized to vary in any way.

Follow the Directions for Use of this product carefully. It is impossible to eliminate all risks inherently associated with the use of this product. Crop or other plant injury, ineffectiveness, or other unintended consequences may result from such risks as weather or crop conditions, mixture with other chemicals not specifically identified in this product's label, or use of this product contrary to the label instructions, all of which are beyond the control of LOVELAND PRODUCTS, INC. and the seller. The buyer or user of this product assumes all such inherent risks.

Subject to the foregoing inherent risks, LOVELAND PRODUCTS, INC. warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes stated in the Directions for Use when the product is used in strict accordance with such Directions for Use under normal conditions of use. EXCEPT AS WARRANTED IN THIS LABEL AND TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, THIS PRODUCT IS SOLD "AS IS," AND LOVELAND PRODUCTS, INC. MAKES NO OTHER WARRANTY, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR ELIGIBILITY OF THIS PRODUCT FOR ANY PARTICULAR TRADE USAGE.

IN THE UNLIKELY EVENT THAT BUYER OR USER BELIEVES THAT LOVELAND PRODUCTS, INC. HAS BREACHED A WARRANTY CONTAINED IN THIS LABEL AND TO THE EXTENT REQUIRED BY APPLICABLE LAW, BUYER OR USER MUST SEND WRITTEN NOTICE OF ITS CLAIM TO THE FOLLOWING ADDRESS: LOVELAND PRODUCTS, INC., ATTENTION: LAW DEPARTMENT, PO BOX 1286, GREELEY, CO 80632.

TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, THE BUYER'S OR USER'S EXCLUSIVE REMEDY FOR ANY INJURY, LOSS, OR DAMAGE RESULTING FROM THE HANDLING OR USE OF THIS PRODUCT, INCLUDING BUT NOT LIMITED TO CLAIMS OF BREACH OF WARRANTY OR CONTRACT, NEGLIGENCE, STRICT LIABILITY, OR OTHER TORTS, SHALL BE LIMITED TO ONE OF THE FOLLOWING, AT THE ELECTION OF LOVELAND PRODUCTS, INC. OR THE SELLER: DIRECT DAMAGES NOT EXCEEDING THE PURCHASE PRICE OF THE PRODUCT OR REPLACEMENT OF THE PRODUCT, TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, LOVELAND PRODUCTS, INC. AND THE SELLER SHALL NOT BE LIABLE TO THE BUYER OR USER OF THIS PRODUCT FOR ANY CONSEQUENTIAL, SPECIAL, OR INDIRECT DAMAGES, OR DAMAGES IN THE NATURE OF A PENALTY.

PHASE® and UNFOAMER® are registered trademarks of Loveland Products, Inc.



PHASE 2.5GL/C2210

Material Safety Data Sheet:
Loveland Products Phase Surfactant

MATERIAL SAFETY DATA SHEET

PHASE®

FOR CHEMICAL EMERGENCY, SPILL, LEAK, FIRE, EXPOSURE OR ACCIDENT, CALL CHEMTREC - DAY OR NIGHT 1-800-424-9300

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

FORMULATED FOR:

LOVELAND PRODUCTS, INC.
P.O. Box 1286 • Greeley, CO 80632-1286

24-Hour Emergency Phone: 1-800-424-9300
Medical Emergencies: 1-800-301-7976
U.S. Coast Guard National Response Center: 1-800-424-8802

PRODUCT NAME: PHASE®
CHEMICAL NAME: Mixture
CHEMICAL FAMILY: Surfactant - Adjuvant
CALIF. REG. NO.: 34704-50037
WASH. REG. NO.: not applicable
MSDS Number: PHS-06-LPI

MSDS Revisions: Sections 4 and 16

Date Of Issue: 12/14/06

Supersedes: 02/17/05

2. HAZARDS IDENTIFICATION SUMMARY

KEEP OUT OF REACH OF CHILDREN - CAUTION - Harmful if absorbed through skin. Causes moderate eye irritation. Avoid contact with skin, eyes or clothing. Wash thoroughly with soap and water after handling.

This product is yellow liquid with a mild fatty odor.

3. COMPOSITION, INFORMATION ON INGREDIENTS

<u>Chemical Ingredients:</u>	<u>Percentage by Weight:</u>	<u>CAS No.</u>	<u>TLV (Units)</u>
Methylated esters of fatty acids, alkylpolyoxy- Ethylene ether and polyether modified polysiloxane	100.00	Mixture	none established

4. FIRST AID MEASURES

If in eyes:	Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advice.
If on skin or clothing:	Take off contaminated clothing. Rinse skin immediately with plenty of water for 15 to 20 minutes. Call a poison control center or doctor for further treatment advice.
If swallowed:	Call a poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by a poison control center or doctor. Do not give anything by mouth to an unconscious person.
If inhaled:	Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration. Call a poison control center or doctor for treatment advice.

5. FIRE FIGHTING MEASURES

FLASH POINT (°F/Test Method):	>212°F / >100°C (PMCC)
FLAMMABLE LIMITS (LFL & UFL):	Not established
EXTINGUISHING MEDIA:	Foam, Dry chemical, CO ₂ , or water spray.
HAZARDOUS COMBUSTION PRODUCTS:	None known.
SPECIAL FIRE FIGHTING PROCEDURES:	Wear self-contained breathing apparatus and full protective gear.
UNUSUAL FIRE AND EXPLOSION HAZARDS:	Dike area to contain run-off and prevent contamination of water supplies. Burning may produce toxic fumes, carbon monoxide, carbon dioxide and oxides of silicon.

6. ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:

Wear appropriate personal protective equipment (refer to Section 8) when responding to spills. Shut off source of leak if safe to do so. Dike and contain spill. Soak up residue with absorbent such as clay, sand or other suitable material and dispose of properly. Flush area with water to remove trace residue. Contain runoff from residue flush and dispose of properly. Place in container for proper disposal. Check local, state and federal regulations for proper disposal.

CAUTION: Keep spills and cleaning runoff out of municipal sewers and open bodies of water.

7. HANDLING AND STORAGE

HANDLING:	Wear impervious gloves when handling. Keep away from heat, sparks, and flames while in use. Wash with soap and water before eating, drinking, smoking, applying cosmetics, or using toilet facilities. Keep away from children, feed and foodstuffs, fertilizers and seed.
STORAGE:	Store in a cool, dry place. Store in original container. Keep tightly closed. Do not reuse empty container. Do not contaminate water, food or feed by storage or disposal.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS: Not required.
RESPIRATORY PROTECTION: Wear a NIOSH approved respirator if necessary.
EYE PROTECTION: Chemical goggles or shielded safety glasses.
SKIN PROTECTION: Wear protective clothing. Wear impervious rubber or chemical-resistant gloves.

For product	OSHA PEL 8 hr TWA not established	ACGIH TLV-TWA not established
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9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AND ODOR: Yellow liquid with a mild fatty odor	BULK DENSITY: 7.59 lbs/gal.	SOLUBILITY: Dispersible
SPECIFIC GRAVITY (Water = 1): 0.91 g/ml	BOILING POINT: 101.2°C/215°F	pH: 7.3 (1% solution)
VAPOR PRESSURE: Not established	EVAPORATION RATE: Not established	
PERCENT VOLATILE (by volume): Not established		

Note: These physical data are typical values based on material tested but may vary from sample to sample.
Typical values should not be construed as a guaranteed analysis of any specific lot or as specification items.

10. STABILITY AND REACTIVITY

STABILITY: Stable
CONDITIONS TO AVOID: None known.
INCOMPATIBILITY: Avoid contact with strong oxidizers, strong acids and bases at high temperatures.
HAZARDOUS DECOMPOSITION PRODUCTS: Carbon Monoxide from burning.
HAZARDOUS POLYMERIZATION: Will not occur.

11. TOXICOLOGICAL INFORMATION

Acute Oral LD₅₀ (rat): >5000 mg/kg [EPA Category IV]	Acute Dermal LD₅₀ (rabbit): >2000 mg/kg [EPA Category IV]
Eye Irritation (rabbit): Mild to moderate irritant [EPA Category III]	Skin Irritation (rabbit): Not a skin irritant [EPA Category IV]
Inhalation LC₅₀ (rat): >0.19 mg/L (4 HR)	Skin Sensitization (guinea pig): Not a sensitizer.
Carcinogenic Potential: None listed by OSHA, NTP, IARC, and ACGIH as a carcinogen	

12. ECOLOGICAL INFORMATION

ALTHOUGH ACTUAL AQUATIC TOXICITY TESTS HAVE NOT BEEN PERFORMED ON THIS PRODUCT, THE COMPONENTS USED IN THE FORMULATION OF THIS PRODUCT DO NOT INDICATE AQUATIC TOXICOLOGICAL CONCERNS.
Do not apply directly to water, or to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment wash waters. (Not for aquatic uses in Washington).

13. DISPOSAL CONSIDERATIONS

Do not reuse product containers. Triple rinse (or equivalent), adding rinse water to spray tank, then offer for recycling at an ACRC site (go to <http://www.acrecycle.org/> for locations) or by reconditioning, or puncture and dispose of in a sanitary landfill or by other procedures approved by state and local authorities. Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility. Do not contaminate water, food or feed by storage or disposal.

14. TRANSPORT INFORMATION

DOT Shipping Description: NOT REGULATED BY USDOT.
Freight Classification: ADHESIVES, ADJUVANTS, SPREADERS OR STICKERS (NMFC 4610; CLASS: LTL 60, TL 35)
Consult appropriate ICAO/IATA and IMDG regulations for shipment requirements in the Air and Maritime shipping modes.

MATERIAL SAFETY DATA SHEET

PHASE®

15. REGULATORY INFORMATION

NFPA & HMIS Hazard Ratings:

NFPA

2 Health
1 Flammability
0 Instability

0 Least
1 Slight
2 Moderate
3 High
4 Severe

HMIS

2 Health
1 Flammability
0 Reactivity
H PPE

SARA Hazard Notification/Reporting

SARA Title III Hazard Category:

Immediate Y
Delayed N

Fire N
Reactive N

Sudden Release of Pressure N

Reportable Quantity (RQ) under U.S. CERCLA: Not listed

SARA, Title III, Section 313: Not listed

RCRA Waste Code: Not listed

CA Proposition 65: Not listed

16. OTHER

MSDS STATUS: Revised First Aid and Disclaimer

PREPARED BY: Registrations and Regulatory Affairs

REVIEWED BY: Environmental/ Regulatory Services

®Phase is a registered trademark of Loveland Products, Inc.

Disclaimer and Limitation of Liability: This data sheet was developed from information on the constituent materials identified herein and does not relate to the use of such materials in combination with any other material or process. No warranty is expressed or implied with respect to the completeness or ongoing accuracy of the information contained in this data sheet, and LOVELAND PRODUCTS, Inc. disclaims all liability for reliance on such information. This data sheet is not a guarantee of safety. Users are responsible for ensuring that they have all current information necessary to safely use the product described by this data sheet for their specific purpose.



InForm Media

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Eugene, Oregon 97401
cp (541) 521-5062
h/fx (541) 345-4855
amy@informproductions.com

Chad Schulze
Pesticide Enforcement Team Lead
1200 6th Ave., Suite 900
OCE-084
Seattle, WA 98101

June 28, 2010

Chad,

Thank you for participating on the HWY 36 private timberland clearcut and pesticide spray tour on June 17, 2010. Also thank you for attending the presentation by Stuart Turner, forest agronomist, held at Marylou Goertzen's home in Deadwood, Oregon.

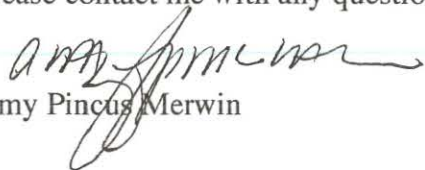
Enclosed is a copy of the DVD of Stuart's presentation on helicopter spray pesticide drift in Western Oregon's Coast Range.

FYI: A copy has also been sent to the following people (including yourself) who either attended in person or via teleconference.

Chad Shulze
Erin Halbert
Scott Downy
Alan Henning
Jill Bloom
Stuart Turner
Deadwood, Oregon and Hwy 36 communities

I am currently writing information to address the history of Agent Orange use in the Oregon Coast Range in consideration of the recent agreement between the U.S. Government and Viet Nam. I will provide those materials to you as soon as they are completed and compiled.

Please contact me with any questions.


Amy Pincus Merwin

Rec'd
PTJ
6/30/10

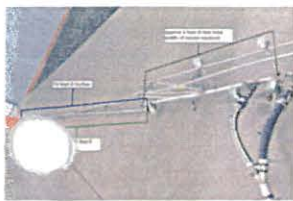
CDs Available upon Request

Video of the Virtual Tour Meeting Presentations

Filmed by Amy Pincus Merwin
(June 17, 2010)

Pictures shown during the Virtual Tour
Pesticide Application near Kohlman's Vineyard

Photos taken by Stuart Turner
(June 16-18, 2010)



1 port side spray section with measurement info.jpg



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2005-07-20_00035.JPG



2005-07-20_00036.JPG



2005 ODA investigation pic004.jpg



2005 ODA investigation pic LARGE for MF001.jpg



2005 ODA investigation pic LARGE for MF002.jpg



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sonidesGroneke 280.jpg



D10 spin spray cloud.jpg



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IMG_9881.JPG



June 12 2009 Kohlman (183 of 183).jpg



KohlmanMay072007 (182).jpg



Topo map with labels small.jpg



1 center section with measurement info.jpg

CD Available upon Request

Aerial Application Videos near Triangle Lake

Filmed by Eron King's

May 13, 2010

Mr. Scott Downey, Unit Manager
EPA - Region 10
1200 6th Ave., Suite 900
Seattle, WA. 98101
206-553-0682
Downey.Scott@epa.gov

Mr. Downey,

I moved to the Oregon Coast Range Valley in 1980 believing that I had moved to paradise. I soon learned that in the 1970s OSU Professor (emeritus) Mike Newton brought Agent Orange, a combination of DOW Chemical's phenoxy herbicides 2,4,5-T and 2,4-D, leftover from the war in Viet Nam to Western Oregon. He also pursued a forestry-herbicide model to use these poisons in which forests were clearcut, then slash-burned, sprayed with Agent Orange, seedlings were planted, and then sprayed, sprayed and sprayed again until the seedlings grew over the native brush (native berries, alder, viney maple and others).

This model was used during the 1970s and early 1980s wherever Western Oregon forests, from the Cascades to the Oregon Coast Range, were clearcut but most intensely in the Alsea-Waldport, Siuslaw-Mapleton National Forest Districts, and in central western Benton, Lincoln and Lane Counties. Thanks to the efforts of neighbors in those districts, Congress stopped the use of these herbicides on national forests in 1983, and DOW's 2,4,5-T was deregistered and no longer made in the US. Unfortunately, DOW avoided the deregistration of 2,4-D and it is still used in Oregon State Forests and on private, corporate timberland in Oregon, along with dozens of other herbicides. And within the last few years, Oregon's Pesticide Use Reporting (PURS) http://www.oregon.gov/ODA/PEST/purs_index.shtml reported that 70,000#s of old stores of the known carcinogen 2,4,5-T, were sprayed in Polk County, Oregon.

Although Agent Orange is a known carcinogen, the by-product of manufacturing 2,4,5-T and 2,4-D is TCDD dioxin, which is defined by Scott Hetch Ph.D. of the National Atmospheric and Oceanic Administration (NOAA) as POP (a persistent pollutant in the environment.) TCDD dioxin adheres to soil sediments and migrates into the watersheds over time and persists *forever*. TCDD mutates the mitochondria of any cell which causes birth defects, miscarriages, stillbirths, cancer, and a multitude of other health problems in humans, and forest and river species. Unfortunately, NOAA and other agencies, such as, the Waldport Water District, PARC and the Oregon Cancer Registry do not authorize testing for nor test for TCDD dioxin when exploring health impacts on humans and, for instance, declining species of salmon.

2,4-D the other Agent Orange component is still presently used with impunity and in combination along with the dozens of other pesticides used alone or in combination, including their proprietary inerts to make forests into forestry plantations, farms into sterile agricultural operations, and roadsides poisoned into non-vegetative, non-living systems. All of these practices cause run-off into the ample waters of Oregon, causing salmon, other aquatic, and wildlife to decline.

Since 1983 in the extremely small valley of Deadwood (12-mile-long watershed; population: 200-300), to use as an example, dozens of people have developed brain tumors, non-Hodgkin's Lymphoma, breast, throat and other cancers; babies have been miscarried, as late as eight months, or stillborn, or born with undifferentiated genitals and/or other birth defects, such as, autism, congenital heart defects, and cleft palate; men are impotent, and two grown men have had sex change operations (which may be completely a normal part of their personal choices, but seems like a high statistic for such a small population, and even more distinct considering that each of them was exposed to the hormonally-based, phenoxy-herbicides of 2,4,5-T and 2,4-D), people have skin diseases, auto-immune disorders, uterine abnormalities, GERD, Diabetes II and sadly more diseases on and on. And MDs aren't trained to diagnose pesticide poisoning, and many residents are unaware of their exposure to pesticides and therefore do *not* know why they or their family members are ill, or that their neighbors in the next valley are also suffering from pesticide poisoning.

Within the last five years, six hundred residents of Waldport, Oregon signed a petition requesting that PARC, and the Oregon Department of Agriculture test the drinking water for the City of Waldport, because of the extremely high incidence of many health issues and abnormalities. So date, nothing has been done about this citizen request. Please consider testing Waldport's water for TDCC dioxin and other carcinogens, as well as the full spectrum of other chemicals, heavy metals and whatever else that might be contributing to this Waldport health anomaly.

<http://www.oregon.gov/ODA/PEST/parcminutes051706.shtml> Old PARC cases; Pitchfork Rebellion]

Please consider conducting epidemiological studies of Waldport, Alsea, Deadwood to develop a baseline of understanding of what is the future of the human, species and environmental health in Oregon given our past experiences, and past and present excessive and near-constant pesticide use in Oregon (forestry, agriculture and roadside.)

Whole communities are ill in Oregon but to date no one will pursue an epidemiological study on any community. I believe that the officials won't do studies, because once they *have to* acknowledge what is actually happening liability for all the loss of life and health, and devastation to the environment will arise and no one wants to take responsibility for *that catastrophe*. For example: How does one repay for thousands of lost lives, ongoing illnesses, and decimation of populations of salmon and other wildlife? How does an entire forest be remediated from dioxin poisoning? Should OSU Professor Mike Newton be held responsible for bringing Agent Orange to Oregon and experimenting on unsuspecting and innocent people? And conveniently, since chemical companies products are 'registered' they are exempt from that liability

For many years Oregon residents have made heroic efforts to explore stopping roadside, agricultural, forestry, etc. spraying of pesticides with officials ranging from the Governor of Oregon's office, Oregon Board of Forestry, ODF, PARC [<http://www.oregon.gov/ODA/PEST/parcminutes051706.shtml>] Old PARC cases; Pitchfork Rebellion], [http://www.oregon.gov/ODF/BOARD/docs/March_2008/A_att_8.pdf], Oregon Department of Agriculture, ODOT and asserting individual actions without many results. Although recently a few very successful pilot projects, such as ODOT Hwy 101 project to not spray pesticides from Newport to Yachats are underway and very successful. Please work with all of these entities to ensure that they do their job to protect the people, species and environment in Oregon. And please encourage the application of the ODOT Hwy 101 model to be extended to all Oregon's roadsides, whether under the auspice of ODOT or each county's road management programs.

Oregonian's for Food and Shelter (OFS) are lobbyists whose Board of Directors consists entirely of representatives of *all* the major chemical companies (DOW, Monsanto, etc.) and that exerts a heavy influence on the Oregon State Legislature, Oregon Board of Forestry, ODF and Oregon Department of Agriculture and other agencies and organizations, such as the Oregon Farm Bureau, thereby keeping in place archaic and dangerous forestry and agricultural practices. These lobbyists and Oregon Agencies collude to maintain the status quo of extreme and excessive (and just plain, daily use) of multiple-types and repeated applications of pesticides on Oregon's forests, farms and roadsides, via airplanes and helicopters (creating huge drift issues), backpack (affecting migrant laborers and their families, and also drift issues) and machinery spraying (impacting local and state government worker, and also drift issues). Please consider what EPA can do to change that dynamic and balance it towards health rather than profit.

For your reference, the following are lobbyists or Oregon agencies that deny the effects of or co-opt the resistance to, or manipulate, and/or control the use of pesticides in Oregon:

Oregonians for Food and Shelter, the primary chemical industry lobbyists in Oregon <http://www.ofsonline.org/>

PARC: Oregon Department of Agriculture's Pesticide Analytical Response Center

<http://www.oregon.gov/ODA/PEST/parc.shtml>

Oregon Board of Forestry [http://www.oregon.gov/ODF/BOARD/index.shtml#About the Oregon Board of Forestry](http://www.oregon.gov/ODF/BOARD/index.shtml#About_the_Oregon_Board_of_Forestry)

Oregon Dept of Agriculture <http://www.oregon.gov/ODA/>

Oregon Department of Forestry <http://egov.oregon.gov/ODF/>

Oregon Farm Bureau <http://www.oregonfb.org/>

Ironically, solutions and alternatives to the use of forestry herbicides are already in practice, and specifically *only* in Oregon. Regarding forestry, Late-Successional Reserve- LSR (Clinton) forestry thins in the Siuslaw National Forest have created a highly productive, non-pesticide-use, and the *only* economically successful national forest in the country.

http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6T6X-3RGTBFX-K&_user=10&_coverDate=04%2F30%2F1997&_rdoc=1&_fmt=high&_orig=search&_sort=d&_docanchor=&view=c&_searchStrId=1334384472&_rerunOrigin=google&_acct=C000050221&_version=1&_urlVersion=0&_userid=10&md5=bff82adb3719bfa15ac8f7c124accf82

https://scholarsbank.uoregon.edu/xmlui/bitstream/handle/1794/6539/Siuslaw_Watershed_Analysis_Beaver_Creek.pdf?sequence=1

http://www.law.fsu.edu/journals/landuse/vol22_2/Neuman.pdf

<http://www.reo.gov/library/lsr/index.htm#2010>

This model could be applied to all national forests, BLM, State of Oregon timberlands, and private timberlands in Oregon, and throughout the Northwest and America with excellent benefits, such as mentioned above. Other options and benefits include: engaging the practice of the precautionary principal; stopping the use of pesticides and thereby reducing the need for depleted and environmentally hazardous (i.e. Gulf of Mexico oil spills) fossil fuels to manufacture them; more employment for local residents (many of whom no longer have timber-related jobs) managing these lands and remediating the soils and water of TCDD dioxin and other toxic/poison chemicals and their by-products; contributing to stopping global climate change by using old growth trees as carbon stores.

Regarding managing Oregon's agriculture without pesticides, from the Oregon Tilth website:

1982, the Willamette Valley chapter of Tilth began an organic certification program to serve the needs of growers looking to protect and promote organic farming. Collaborating with the states of California and Washington, Willamette Valley Tilth drafted the *first* Standards and Procedures for organic production. These standards became the blueprint for the California and Washington programs, and eventually the National Organic Program. In 1986, Willamette Valley Tilth became Oregon Tilth, and inherited the momentum and the non-profit

status from Regional Tilth.

Oregon Tilth shared its model of certification with other organizations to implement programs in other parts of the country and the world. With a sound background of materials review, in 1997, Oregon Tilth helped form the Organic Materials Review Institute (OMRI), which continues to flourish in evaluating materials for use in organic farms and processors throughout the country. Oregon Tilth was one of the first to recognize that the standards of organic agriculture needed to be applied to the food processing environment in order to effect change on a national level and inspire the transition of millions of acres to sustainable, organic practices.

Today, Oregon Tilth is one of the largest certifiers in the country and undeniably the most balanced—roughly half of our certified operators are farms and the other half processors. This gives Oregon Tilth a unique and invaluable perspective on the entire supply chain, from seed to table, farm to fork, literally from the ground up.

I understand the limits of the federal government's influence on private property owners and their holdings, but I also know that fed trumps state, state trumps county, etc. And, for example, since the Oregon Forestry Practices Act (created and managed by the Oregon Board of Forestry whose very legal construct includes those with a forestry interest, and perhaps conflict of interest) allows dangerous timber pesticide practices *if* the federal government changed from allowing the chemical companies to test their own products, register those products, and then use them without oversight of that use (i.e. no independent testing for single pesticides or for combined use of pesticides and their proprietary inerts and other dangerous practices) to the precautionary principle now in practice in the EU and widely accepted as the normal standard throughout the world, then the Oregon Board of Forestry (and other agencies/entities) would have no choice but to follow suit.

Dr. Samuel Epstein MD, Ph.D. from the University of Illinois and author of *CancerGate, Stop Cancer Before it Starts: How to Win the War on Cancer*, and many other books, excerpted from http://www.preventcancer.com/losing/nci/blame_victim.htm.

NCI Rejects the Precautionary Principle

The U. S. National Cancer Institute ignores the fundamental and world-wide acceptance of the Precautionary Principle. Illustratively, it has failed to undertake research on nationwide community concerns on clusters of adult and childhood cancers in the vicinity of major air polluting urban facilities, nuclear power plants, petrochemical industries, and Superfund hazardous waste sites; these are disproportionately and discriminatorily located in low socio-economic, African-American, and other ethnic communities. This failure is further compounded by the availability of data on air and water pollutants from large chemical industries and hazardous waste sites, following EPA's creation of The National Toxic Release Inventory (TRI) in 1987. ... Worse still, both NCI and ACS have remained silent or dismissive of such concerns. Furthermore, NCI's silence fails to reflect substantial data incriminating avoidable and unknowing exposures of the population-at-large to industrial carcinogens, particularly Persistent Organic Pollutants (POPs), and novel man-made radioactive isotopes which contaminate the totality of the environment: air, water, soil, the workplace, and consumer products, such as food, household products, cosmetics and toiletries. Such exposures have, to varying degrees, been incriminated in the escalating incidence of overall and site-specific cancers over recent decades.

Lastly, if the EPA will take leadership in Oregon then other states will follow. Having a national policy that protects with precaution its residents, species and environment rather than outmoded industry practices to poison the former indiscriminately will lead to a healthy, whole and thriving America. That conceptual 'leap' may seem large but it begins with stopping poisoning and starting economic and environmental practices that are sustainable, green and vital for the future of our nation and planet.

Thirty years later I still believe I live in paradise, albeit I've sadly learned—a 'poisoned paradise', but one that with care, concern, and study, and the actions of remediation, reclamation and rehabilitation applied to its environment, species and residents can be restored to health and vitality.

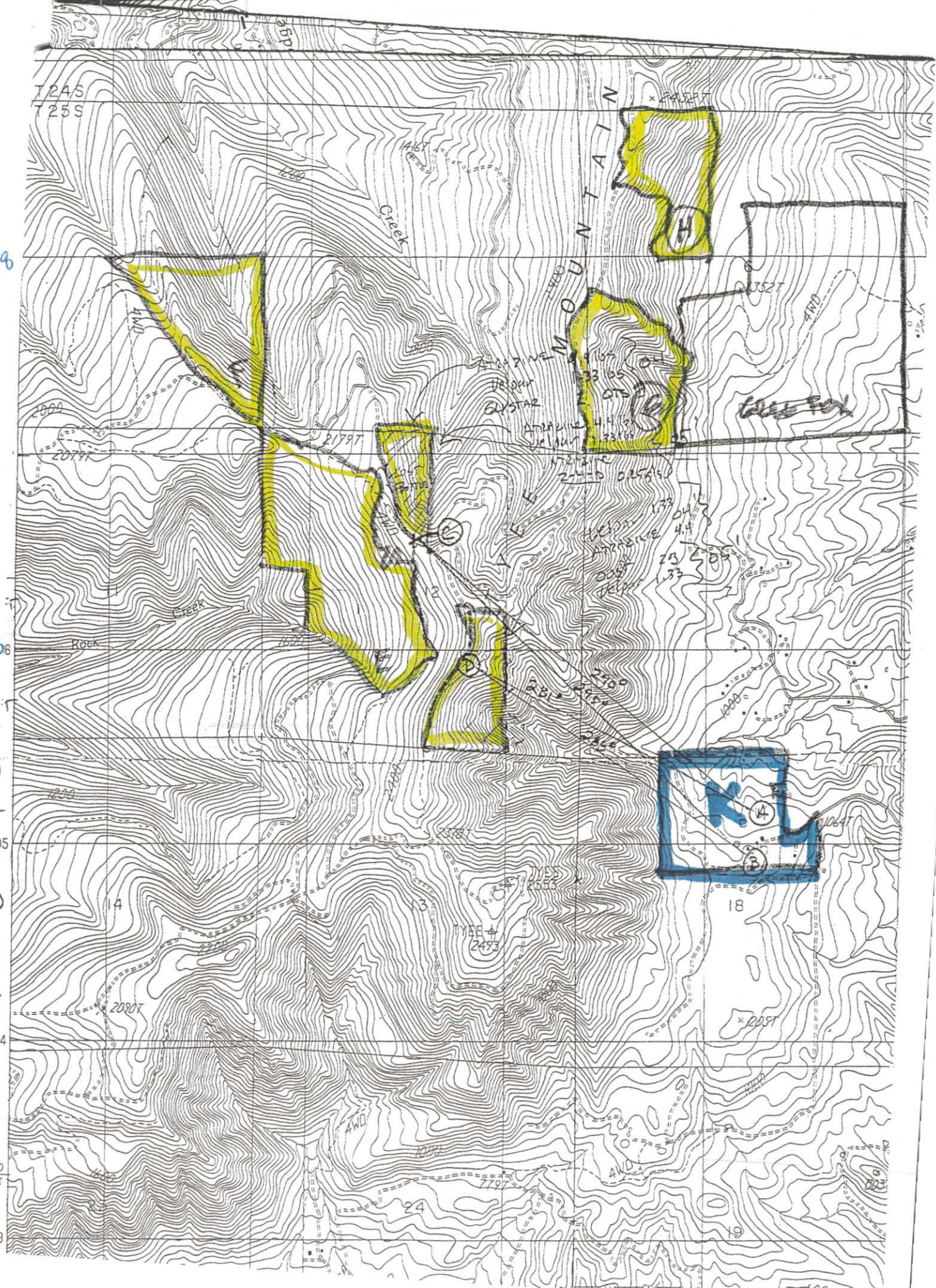
Thank you for your consideration of the above information and my requests for the EPA to take immediate action to remedy the grievances discussed above.

Sincerely,

Amy Pincus Merwin
Residence: 2220 Sandy Drive Eugene, Oregon 97401
541.521.5062
amy@informproductions.com

Properties owned and directly impacted by pesticide use:
92201, 92187, 92049, 92098 West Fork Rd., Deadwood, Oregon 97430
368, 350 Vingie Lane, Yachats, Oregon 97498

09
06
05
4804
1000 FEET
4803



This is a detailed topographic map of a region featuring the Umpqua River. The map is overlaid with a grid. Key features include:

- Contour Lines:** Numerous contour lines are drawn, with labels such as 2000, 2077, 2000, 1200, 14, 2090, 1600, 1400, and 400.
- Water Features:** A prominent river, labeled 'Umpqua River' at the bottom, flows through the area. A tributary, 'Rock Creek', is also labeled.
- Grid and Coordinates:** A grid system is present, with numerical labels like '306T', '41', '30'', '40'', '60'', and '61' along the bottom edge.
- Other Labels:** The word 'Rock' is written near a creek, and 'Umpqua' is written near the river.
- Scale:** A scale bar at the bottom indicates distances of 30', 40', and 60'.

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PRODUCED BY THE UNITED STATES GEOLOGICAL SURVEY
CONTROL BY USGS NOS/NOAA AND STATE DEPT.
COMPILED FROM AERIAL PHOTOGRAPHS TAKEN
FIELD CHECKED 1983. MAP EDITED
PROJECTION LAMBERT CONFORMAL CONIC

CDs Available upon Request

Aerial Application Video taken near Kohlman's Vineyard

(April 7, 2009)

Lone Rock Spray near Kohlman's Vineyard

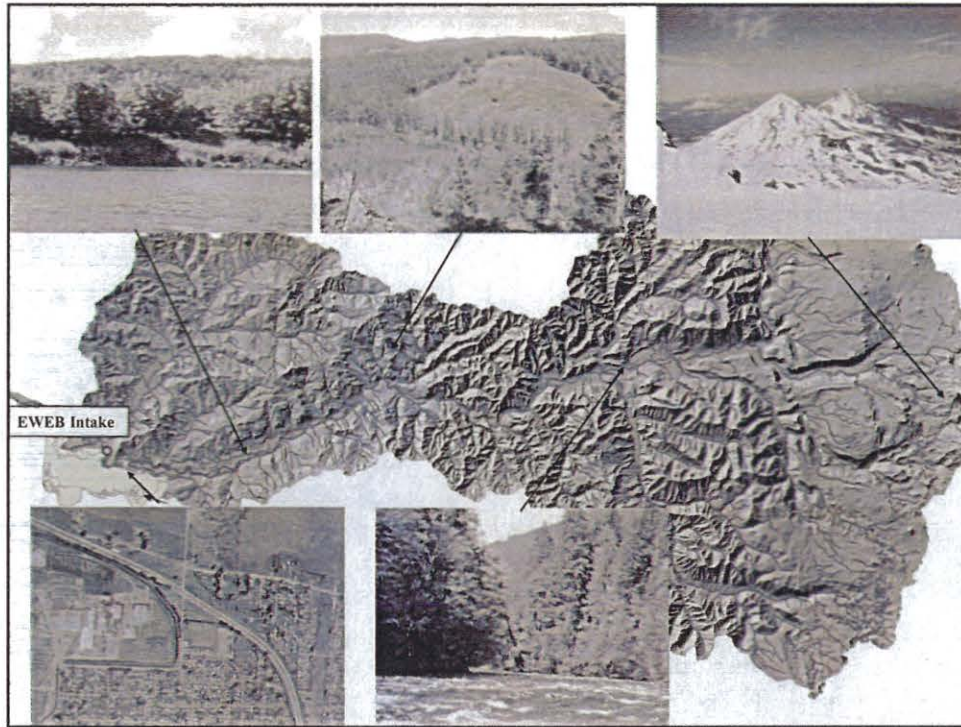
PROTECTING THE SOURCE:

Forestry & Drinking Water

Karl Morgenstern, Eugene Water & Electric Board

EWEB

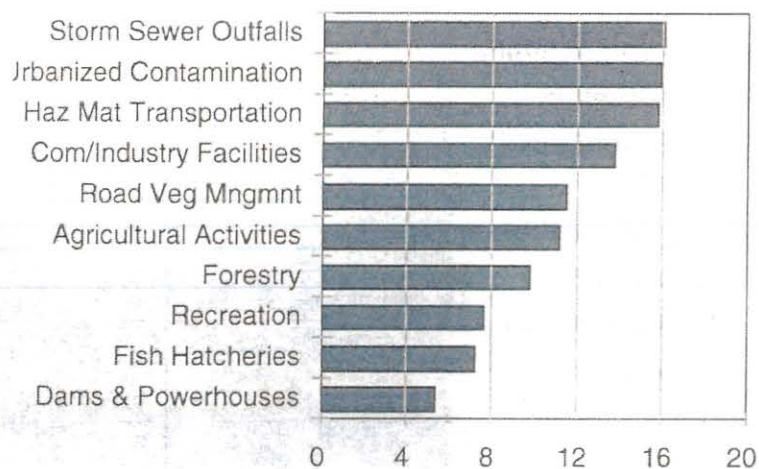




Drinking Water Protection Plan

- The drinking water protection plan technical report was completed in August 2000.
 - Source Protection Monitoring
 - Effective Partnerships
 - Regulatory Analysis
 - Environmental Setting & Risk Assessment
- Protection Plan completed in October 2000.
- The Board adopted plan in October 2000.

RISK CATEGORIES RANKED BY AVERAGE SCORE



DWSP Plan Goals and Objectives

- Goal: Protect the McKenzie River as a reliable source of excellent drinking water for present and future generations.
- Objectives:
 - To prevent, minimize, and mitigate activities that have known or potentially harmful impacts on source water quality.
 - To promote public awareness and stewardship of a healthy watershed ecology in partnership with others.

Source Protection Program Objective

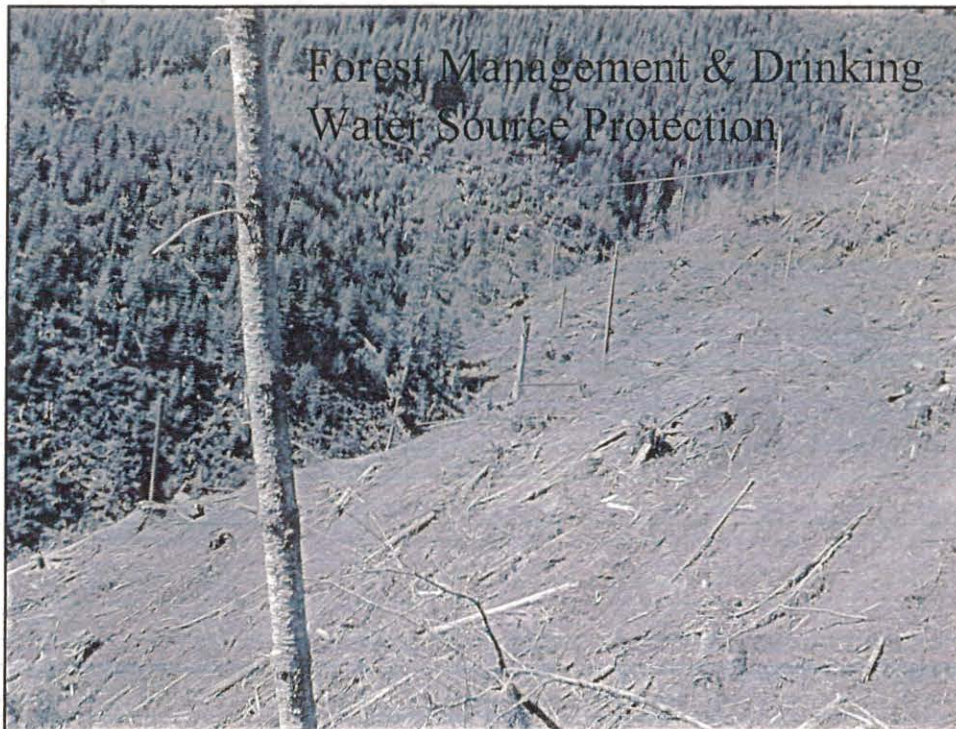
- To measure the balance between watershed health and human use over time and to implement actions that maintain a healthy balance for production of exceptional water quality.



Elements of Source Protection Program

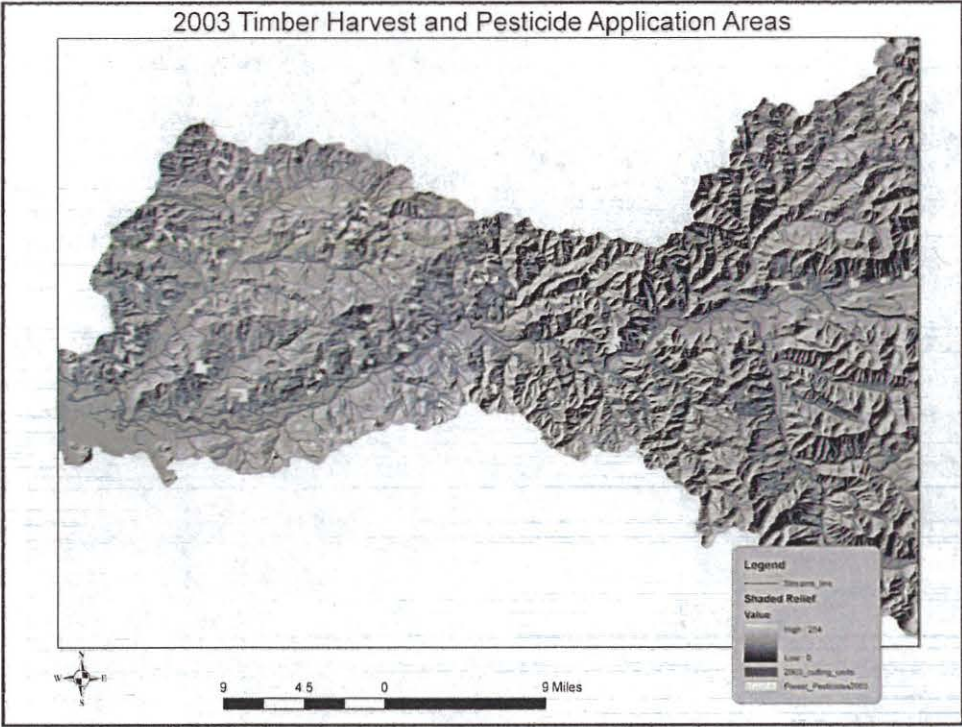
- Comprehensive Monitoring
- Disaster Preparedness and Response
- Point Source Evaluation and Mitigation
- Nonpoint Source Evaluation and Mitigation
- Education and Research Assistance
- Land Acquisition
- Watershed Land Use Tracking and Management
- Public Outreach and Information Sharing

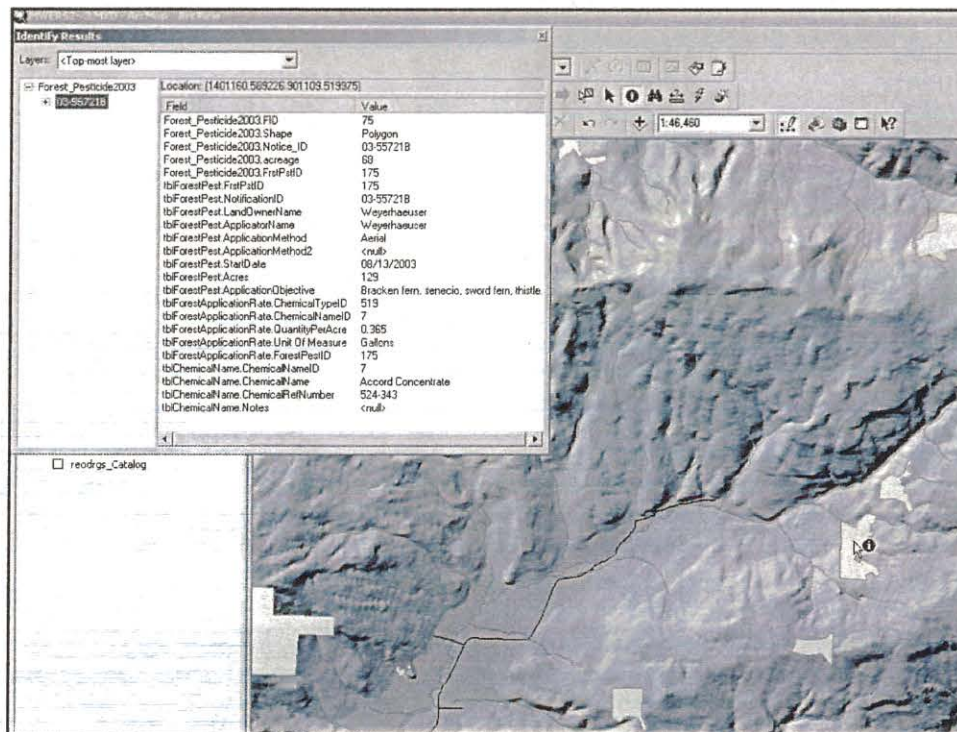




Forestry Goals & Objectives

- Conduct a baseline assessment of forestry activities and better understand potential effects to drinking water quality.
- Build long-term relationships with private and industrial timber land owners, forestry agencies, researchers, and watershed stakeholders to maintain healthy forests, reduce chemical use, pursue sustainable forest management practices and maintain the economic viability of forestry.





Operation Notices Summary

Number of Notices, Acres

The number of notices for this year is smaller than in the previous several years, as is the average acres per notice:

Year	Number of Notices	GIS Acres	Average Acres per Notice
2002	85	10,880	128
2003	74	12,272	166
2004	37	5,902	157
2005	51	10,160	199
2006	50	36,956	739
2007	82	23,185	283
2008	65	15,811	243
2009	34	5,780	170
Total	478	120,846	253

Rate of Application Rate Reporting

The proportion of chemical rate reported on notices continues to be low:

Application Rate Quantity Source	2001	2002	2003	2004	2005	2006	2007	2008	2009	Total
Actual	2	85	57	98	58	18	20	3	4	285
Estimated			7	10	31	31	57	64	30	230

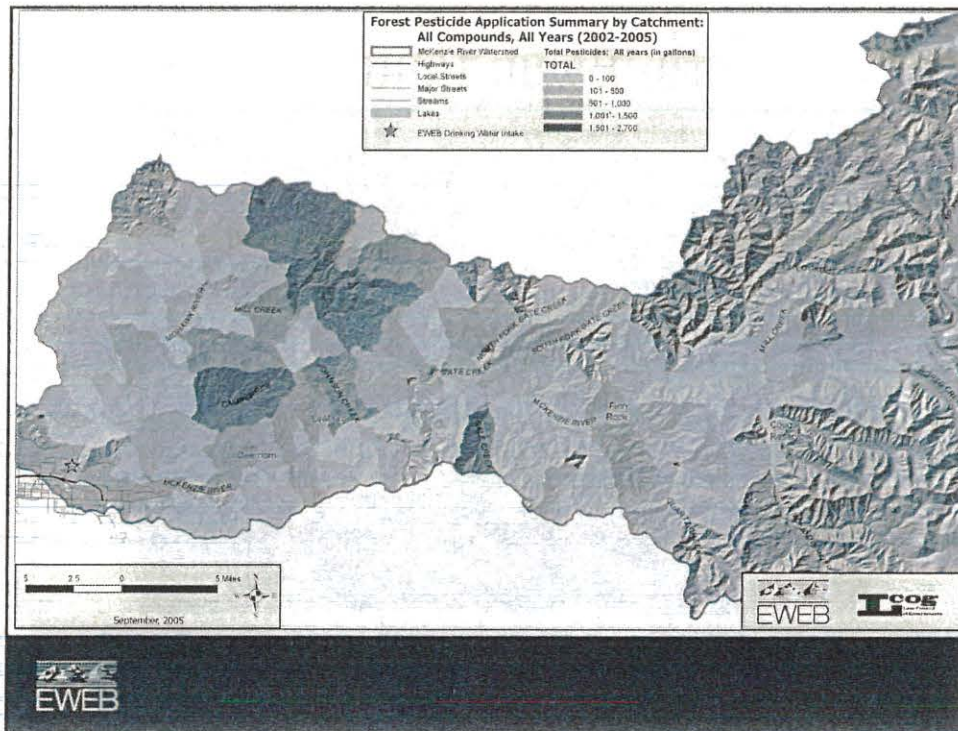
Chemical Name	Notice average	Notice Min	Notice Max	Number of Entries	Literature Min	Literature Max
Velpar DF	0.265884598	0.012625	0.75	69		
Accord SP	0.371875	0.03125	0.5	6		
Arsenal	1.048127366	0.0025	12.5	102	0.5	0.75
Conifer-90	0.526222219	0.48	0.528	27		
2,4-D Savage	0.239999995	0.24	0.24	1		
Chopper	0.101788195	0.0078125	0.6	54	0.1872	0.3744
Accord Concentrate	0.279355722	0.003906	1.875	108		
Velpar L	0.605090909	0.156	1	11	0.125	0.75
Garlon 4	0.404136881	0.0015	10	116	0.25	1
Oust	0.069179927	0.002344	3	80		
Transline	0.20582777	0.03125	10	74	0.03125	0.16625
Escort	0.007692929	0.002344	0.015625	21		
Amine 4	0.384855775	0.03125	0.4	26	0.5	0.75
Support	0.011654845	0.002344	0.0625	71		Suspension Agent
FighterF	0.008073208	0.002344	0.3	72		
Methylated Seed Oil	0.5	0.5	0.5	2		Surficate
Activator 90	0.105749249	0.005	1	35		Surficate
R-11	0.012625	0.012625	0.012625	2		Surficate
LI-700	0.042565104	0.0025	0.25	24		
Herbimax	0.44911812	0.002344	20	59		Surficate
Escort XP	0.016062491	0.0078125	0.078125	11	0.002574	0.0312
Mirage	0.5	0.5	0.5	4	0.25	0.375
Slygard	0.048792545	0.0025	0.25	11		



Year	Total Herbicides (gallons)	Total Adjuvant (gallons)	Total Acres Treated	Top herbicides Used (% of total a.i. in indicated year)
2002 ¹	5,180	890	23,076	Imazapyr (42%); Glyphosate (32%)
2003	7,351	6,565	40,292	Gly (34%); 2,4-D (14%); Hexazinone (11%); Triclopyr (10%)
2004 ²	3,999	90	19,407	Imaz (25%); Gly (22%); Tri (14%); 2,4-D (10%)
2005	9,763	3,241	49,839	Gly (33%); 2,4-D (29%); Hex (14%); Tri (13%)
2006	15,273	21,551	41,442	Imaz (61%); Tri (20%); Gly (16%)
Avg	8,313	6,532	34,811	



Note: Gly = Glyphosate; Hex = Hexazinone; Tri = Triclopyr; Imaz = Imazapyr
 1. Chemicals listed in the Mohawk Valley Field Report for 2002
 2. Partial year reported in 2001 notification submission



Forestry - Commonly Used Chemicals

- Imazipyr 27%
- Diesel Fuel (as a carrier) 15%
- Glyphosate 13%
- Atrazine 12%
- Hexazinone 10%
- Triclopyr 5%
- 2,4-D 5%

Storm Event Equipment



70,000 lbs of pollution loadings to surface waters occur during storm runoff events.

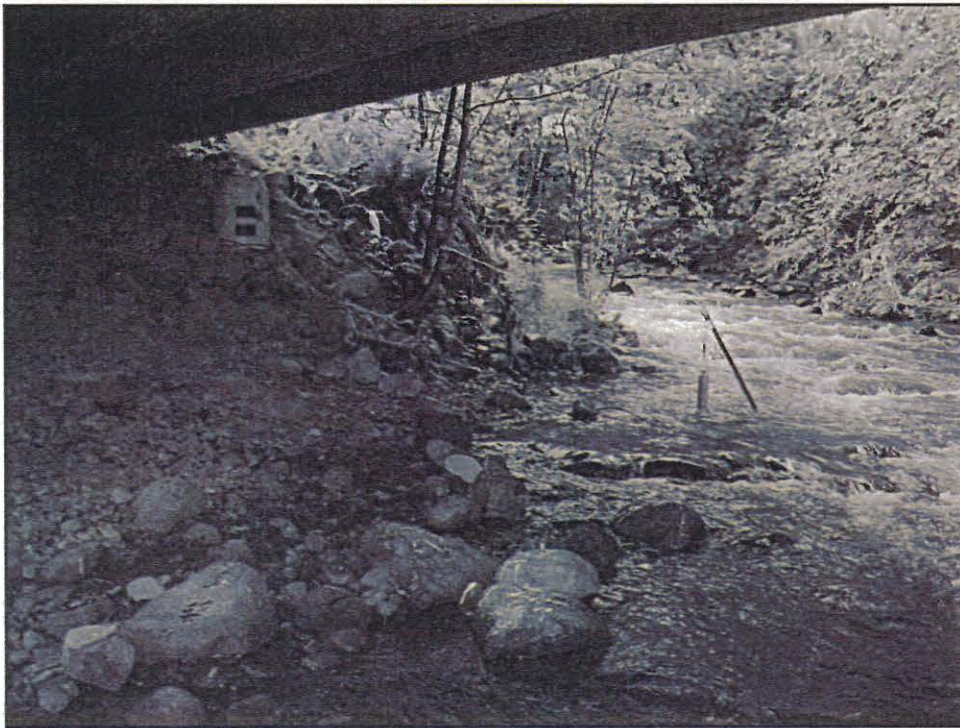
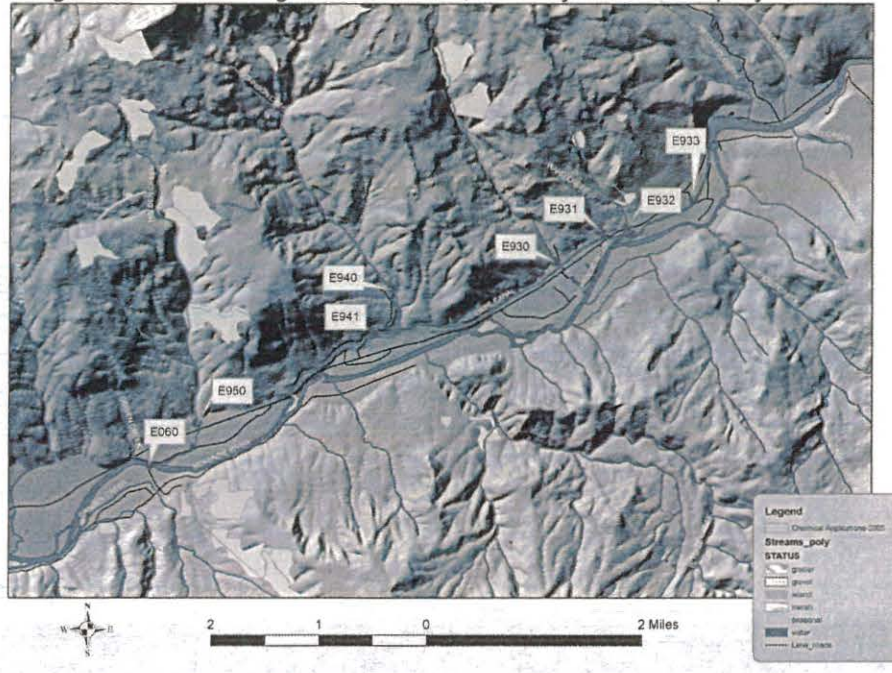


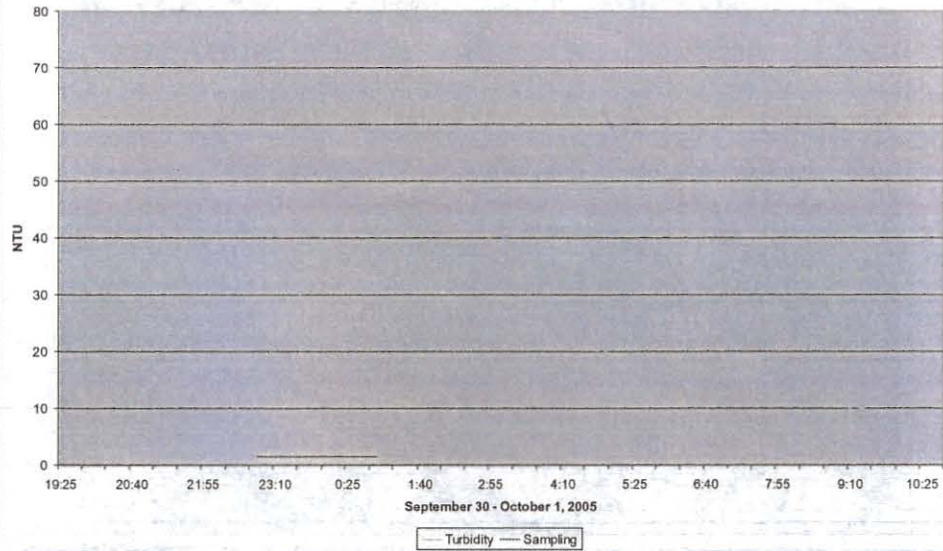
Figure 3-3: Monitoring Site Locations, Forestry Chemical Spray Areas



Summary of Dissolved Pesticides (ug/L) September 2005

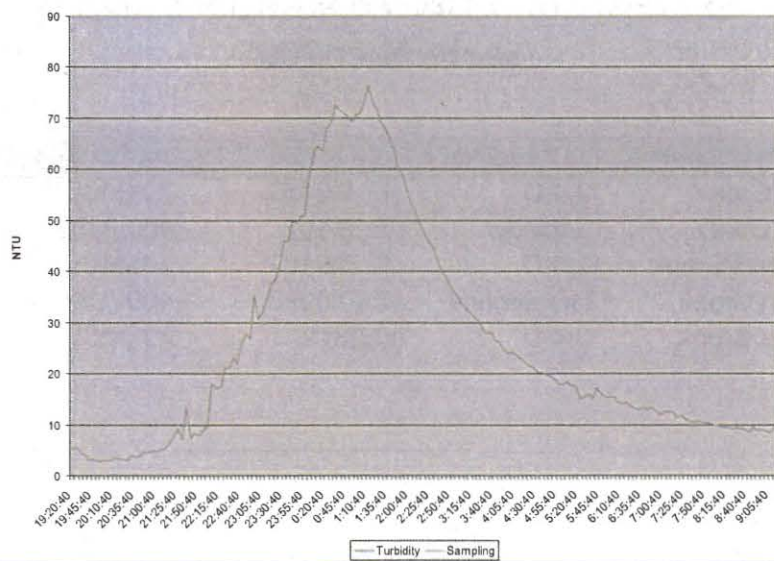
Site Location	Analyte	Value	Health Based Level
Ward Creek	2,4-D	E 0.0159	70 (MCL)
Ward Creek	Triclopyr	E 3.102	400 (USGS)
Cogswell Creek	2,4-D	E 0.0167	70 (MCL)
Holden Creek	Hexazinone	E 0.0078	400 (USGS)
Holden Creek	2,4-D	0.0372	70 (MCL)

Figure 4-11b: Holden Creek (E950)



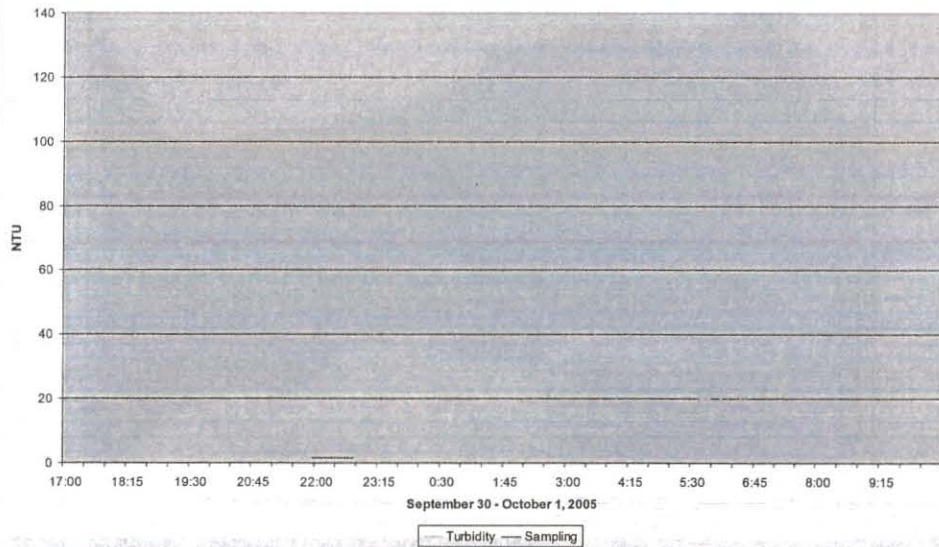
EWB

Cogswell Creek - Sept 30, 2005 Storm



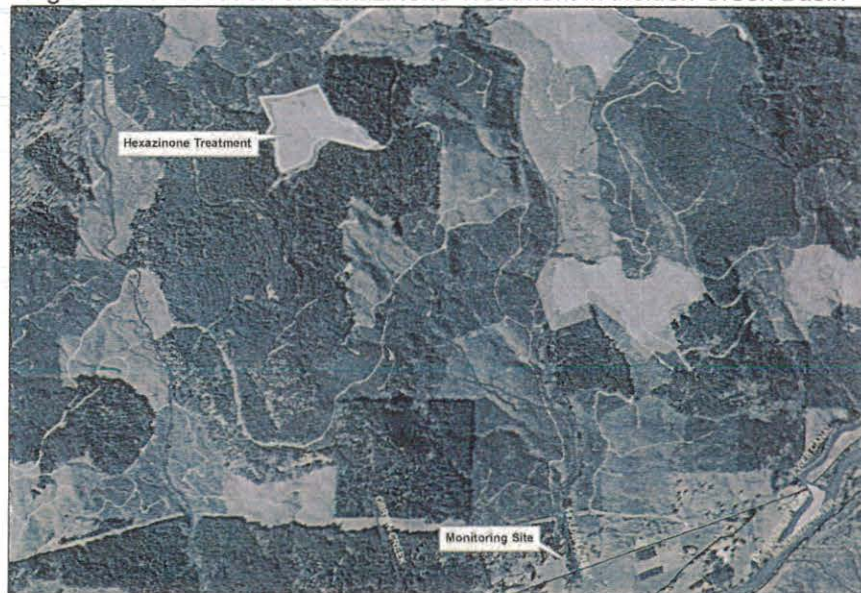
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Figure 4-12b: Johnson Creek (E940)



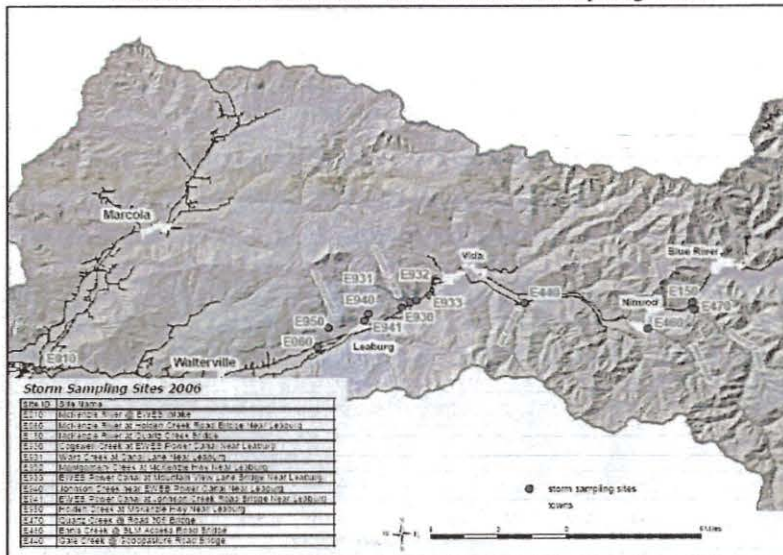
EWB

Figure 4-15: Location of Hexazinone Treatment in Holden Creek Basin



3,400 1,700 0 3,400 Feet

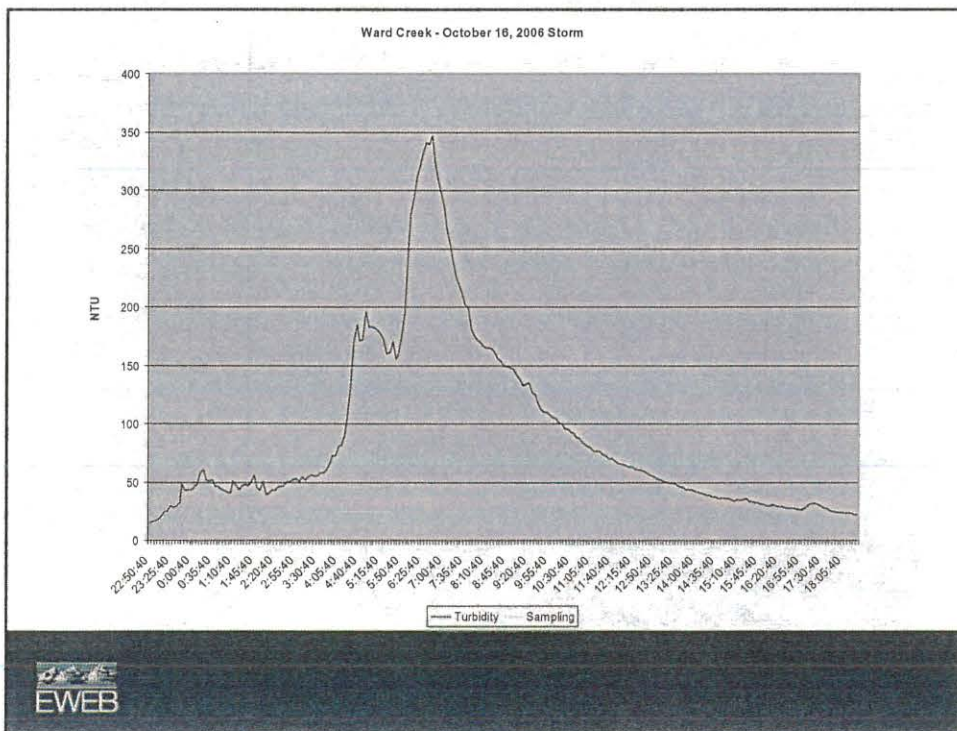
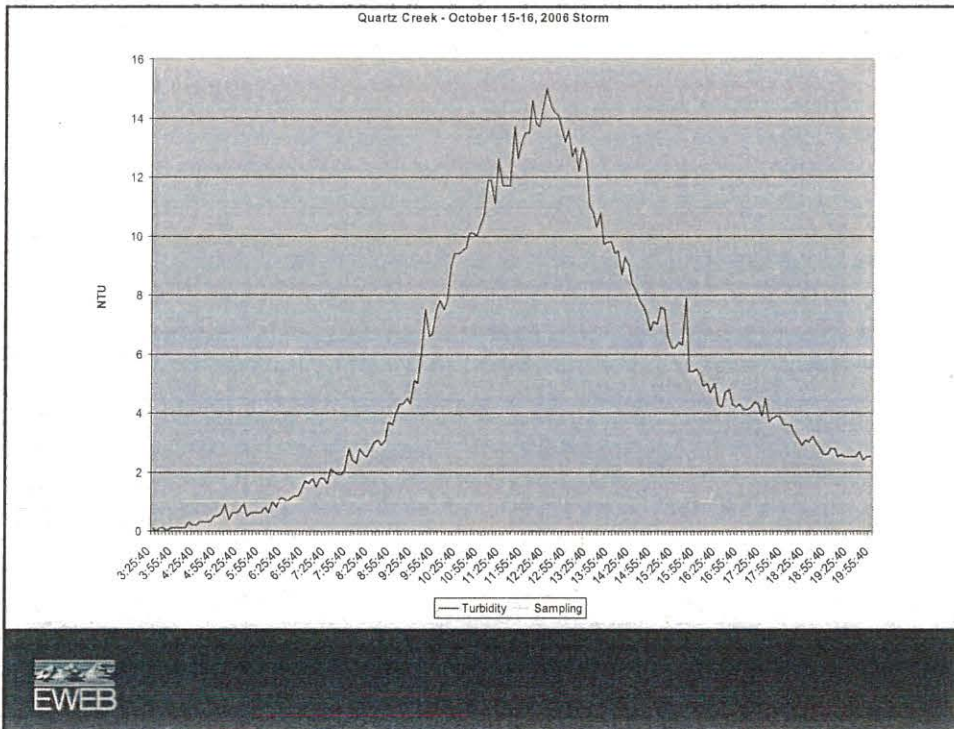
McKenzie Watershed - 2006 Storm Sampling Sites

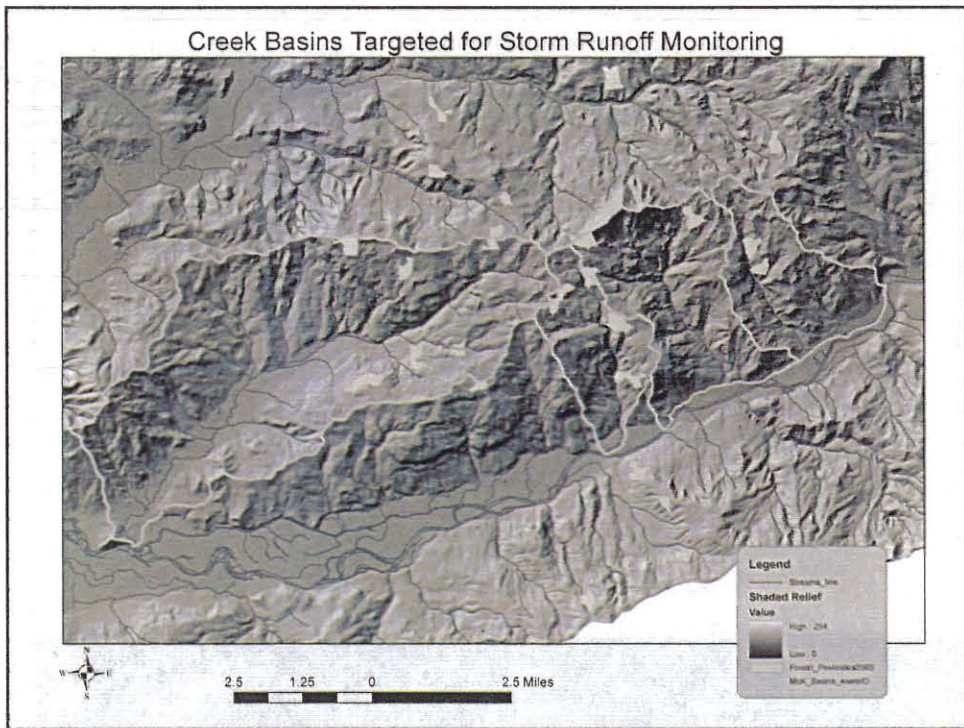
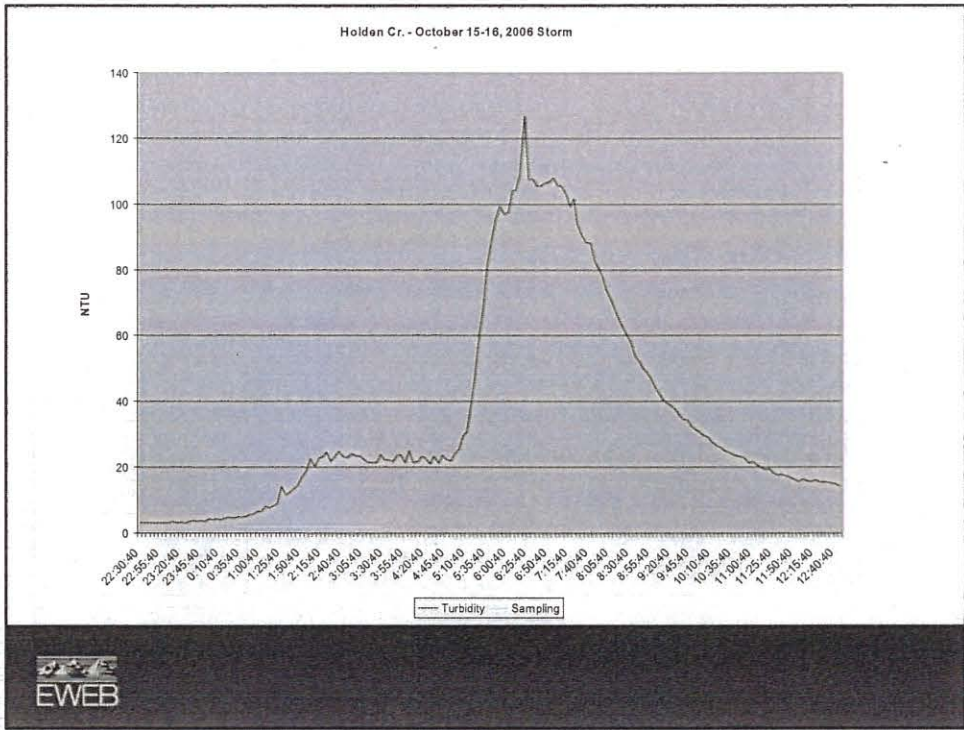


Summary of Dissolved Pesticides (ug/L) October 2006

Site Location	Analyte	Value	Health Based Level
Ward Creek	Imazapyr	0.089	20000 (USGS)
Quartz Creek	Imazapyr	0.024	20000 (USGS)
Holden Creek	2,4-D	0.022	70 (MCL)

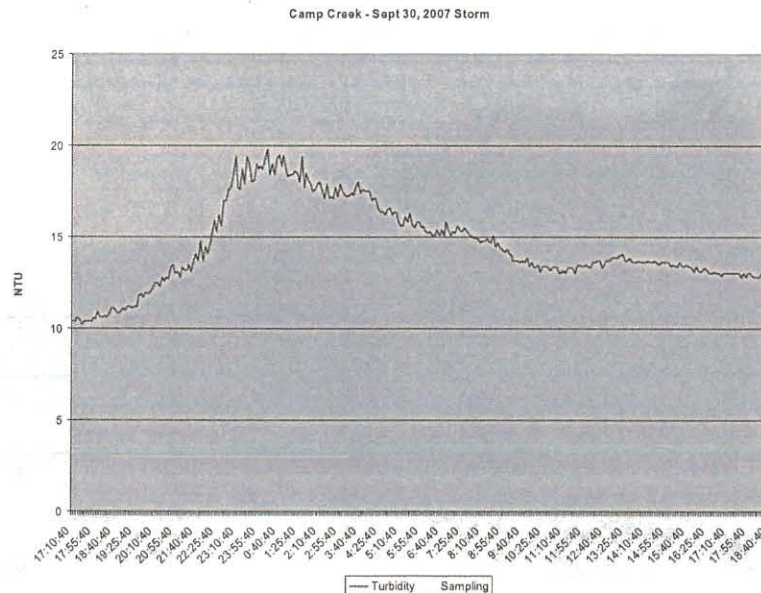


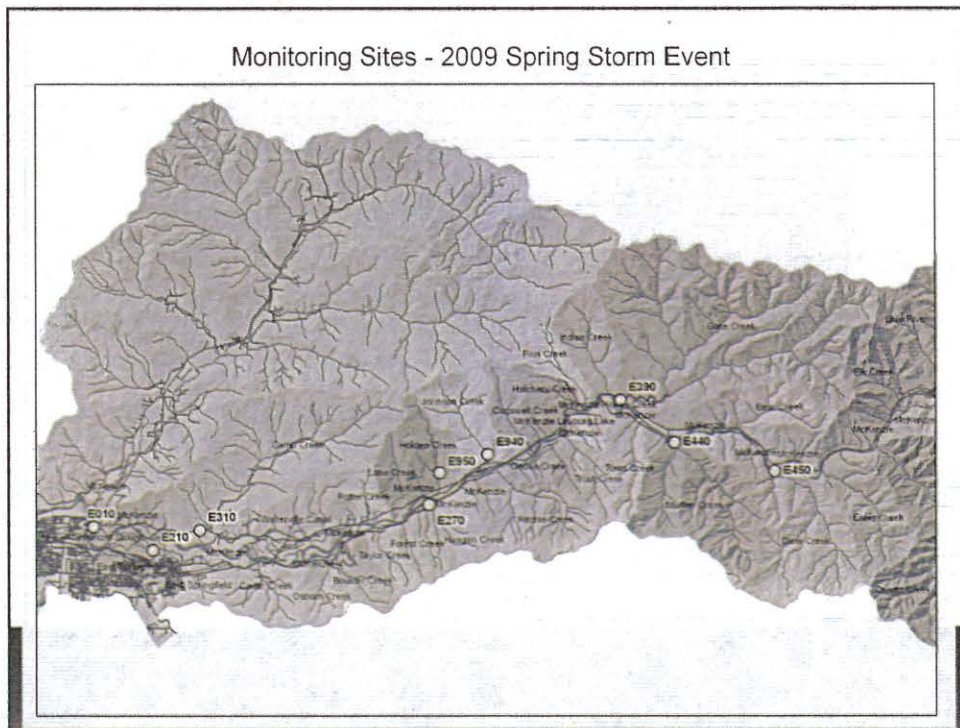
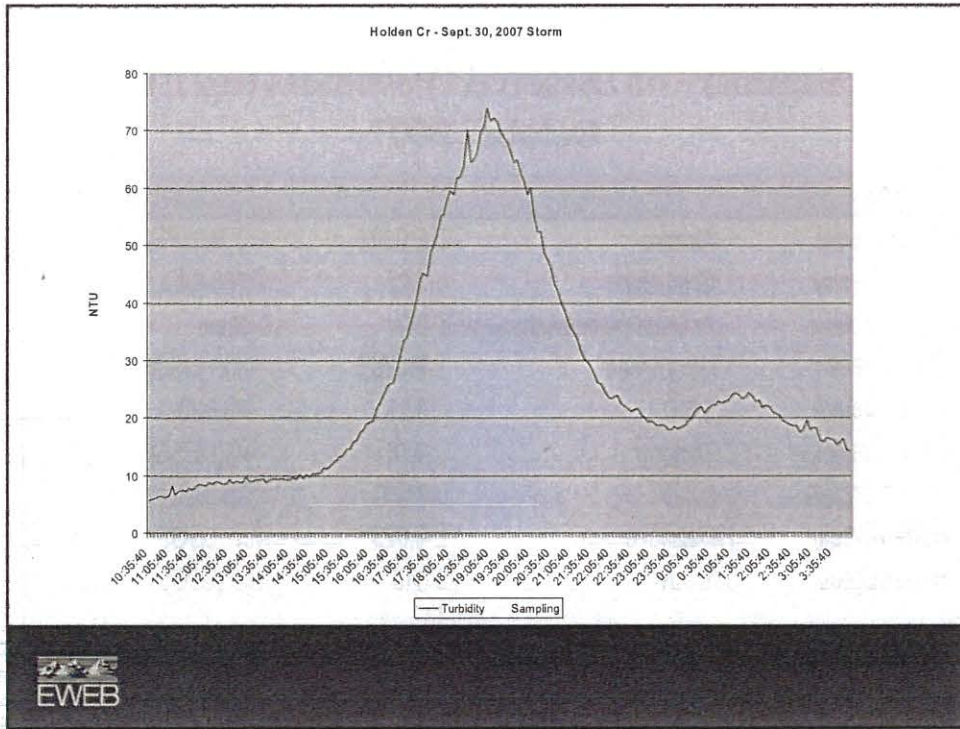




Summary of Dissolved Pesticides (ug/L)* October 2007

Site Location	Analyte	Value	Health Based Level
Camp Creek	Atrazine	E 0.006	0.303 (PRG)
Camp Creek	Glyphosate	0.22	700 (MCL)
Camp Creek	Aminomethylphosphonic acid	0.04	None
Camp Creek	Hexazinone	E 0.025	400 (USGS)
Camp Creek	2,4-D	0.23	70 (MCL)
Camp Creek	Triclopyr	0.161	400 (USGS)
Holden Creek	2,4-D	0.049	70 (MCL)
Holden Creek	Hexazinone	E 0.023	400 (USGS)
Holden Creek	Triclopyr	0.042	400 (USGS)





Summary of Dissolved Pesticides (ug/L) - May 2009

Site Location	Analyte	Value	Health Based Level
Camp Creek	2,4-D	E 0.03	70 (MCL)
Camp Creek	Atrazine	E 0.005	0.303 (PRG)
Camp Creek	CIAT	E 0.006	
Camp Creek	Hexazinone	0.021	400 (USGS)
Camp Creek	Imazapyr	E 0.005	20000 (USGS)
Camp Creek	Imidacloprid	0.159	400 (USGS)
Deer Creek	Aminomethylphosphonic acid	0.02	None
Deer Creek	Atrazine	0.009	0.303 (PRG)
Deer Creek	CIAT	E 0.005	
Gale Creek	Hexazinone	E 0.009	400 (USGS)
Gale Creek	Imazapyr	E 0.009	20000 (USGS)
Gate Creek	Aminomethylphosphonic acid	0.02	None
Gate Creek	Atrazine	E 0.005	0.303 (PRG)
Gate Creek	Hexazinone	0.008	400 (USGS)
Haagen Creek	Atrazine	E 0.005	0.303 (PRG)
Haagen Creek	CIAT	E 0.007	
Haagen Creek	Hexazinone	E 0.011	400 (USGS)
Haagen Creek	OIET	E 0.007	

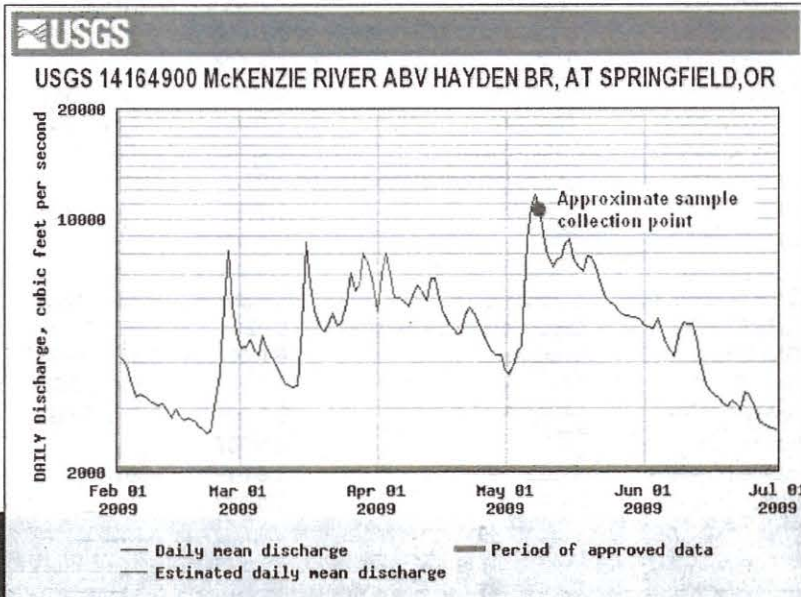


Summary of Dissolved Pesticides (ug/L)* May 2009 (cont)

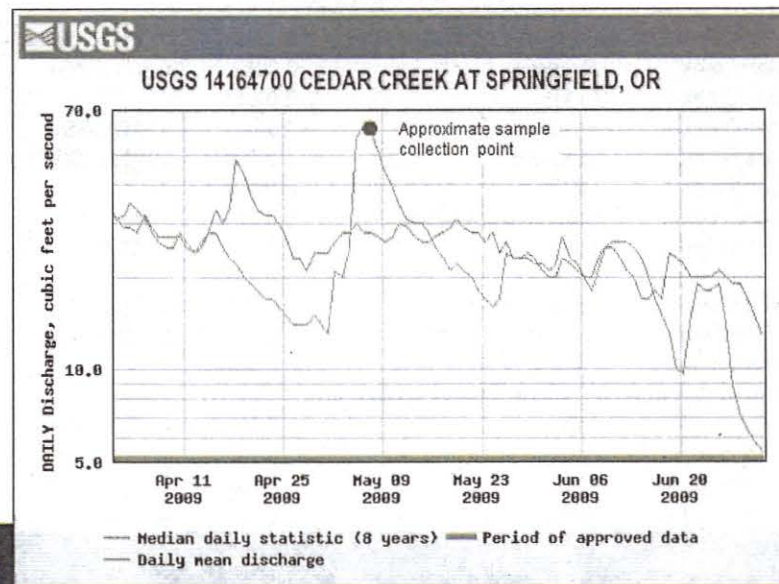
Site Location	Analyte	Value	Health Based Level
Holden Creek	Atrazine	0.008	0.303 (PRG)
Holden Creek	CIAT	E 0.013	
Holden Creek	Hexazinone	0.097	400 (USGS)
Holden Creek	Imazapyr	E 0.209	20000 (USGS)
Holden Creek	OIET	E 0.006	
Holden Creek	Sulfometuron-methyl	E 0.01	2000
Johnson Creek	Atrazine	E 0.006	0.303 (PRG)
Johnson Creek	CIAT	E 0.007	
Johnson Creek	Hexazinone	0.009	400 (USGS)
Johnson Creek	Imazapyr	E 0.012	20000 (USGS)
Johnson Creek	OIET	E 0.007	
McKenzie @ Hayden	Aminomethylphosphonic acid	0.02	None
McKenzie @ Hayden	Atrazine	E 0.006	0.303 (PRG)
McKenzie @ Hayden	Carbaryl	E 0.005	3650 (PRG)
McKenzie @ Hayden	CIAT	E 0.004	
McKenzie @ Hayden	Hexazinone	E 0.007	400 (USGS)



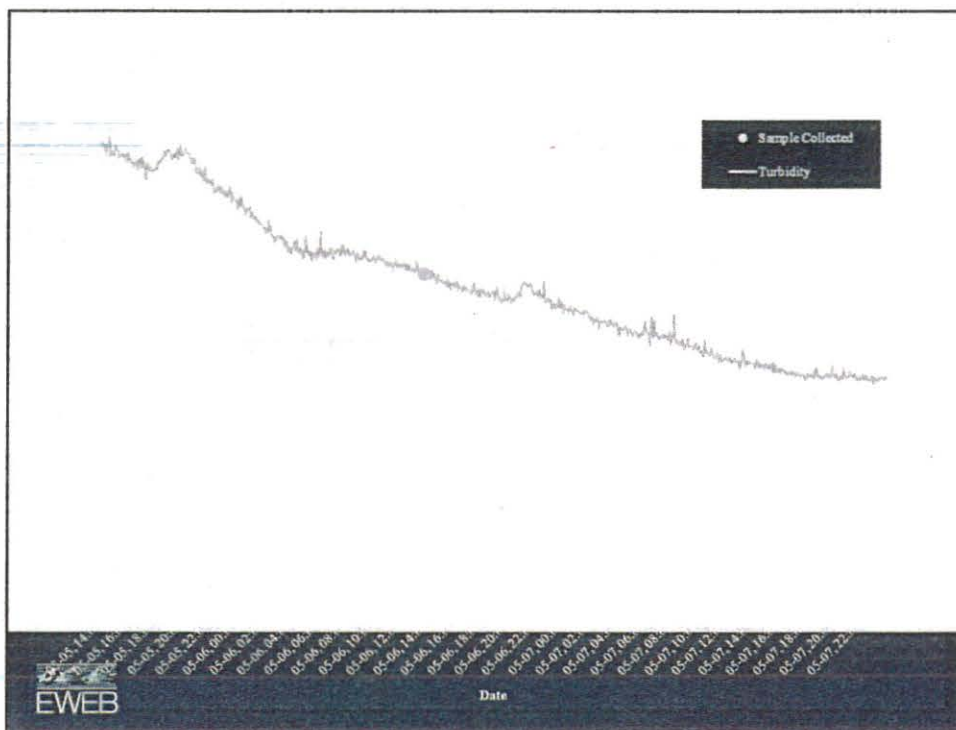
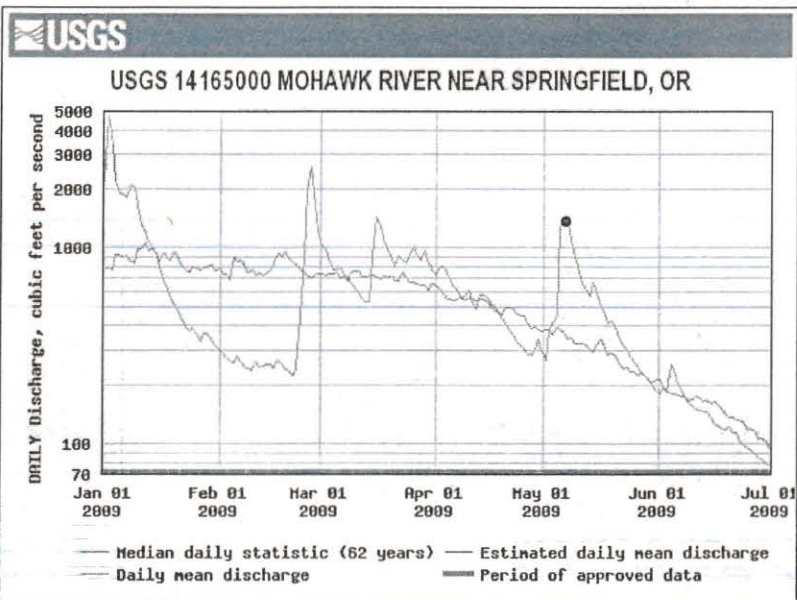
Hayden Bridge (Site E010) – 2009 Spring Storm Event

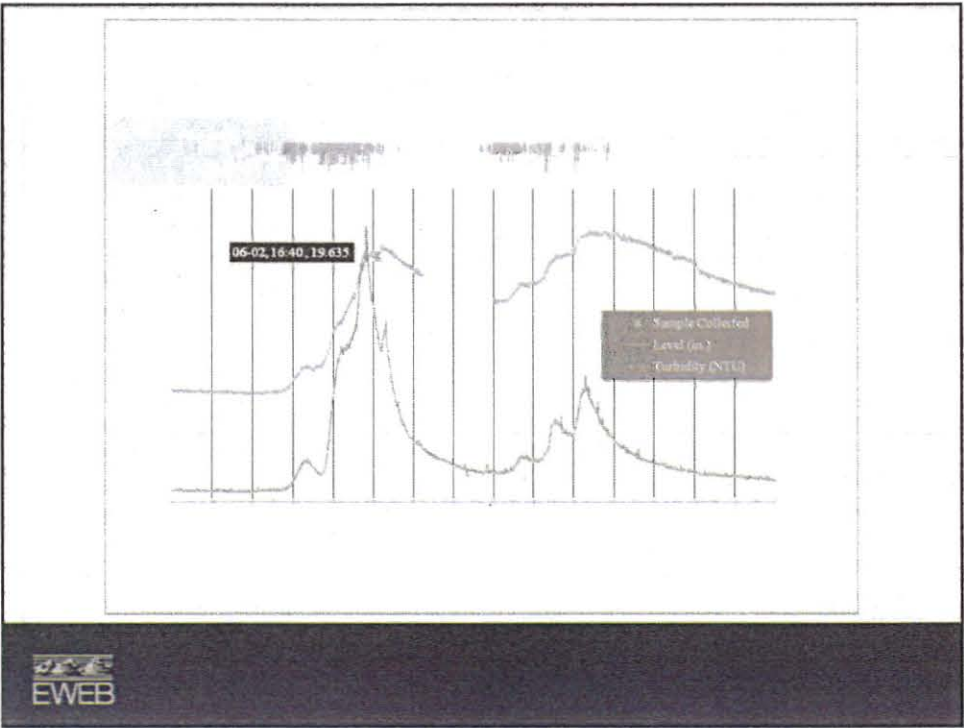


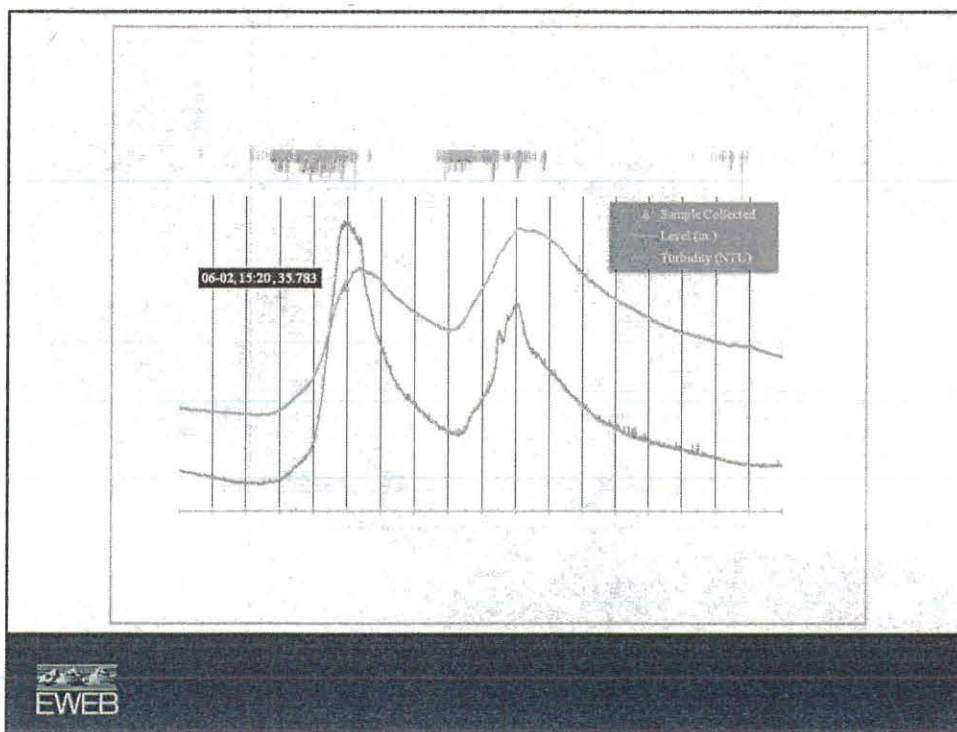
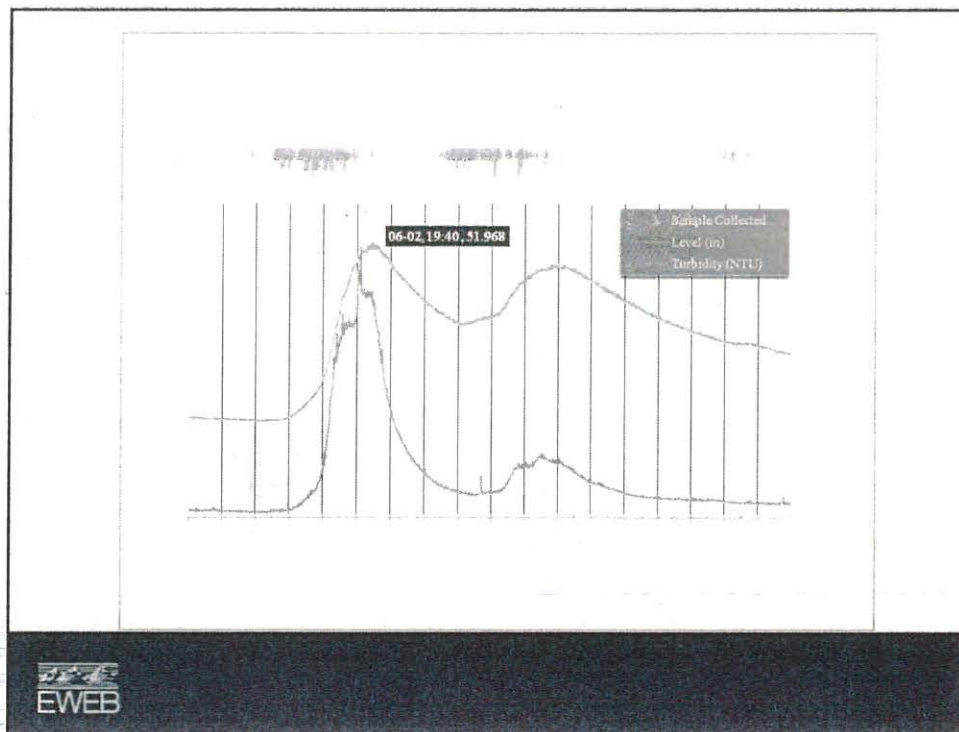
Cedar Creek (Site E210) – 2009 Spring Storm Event

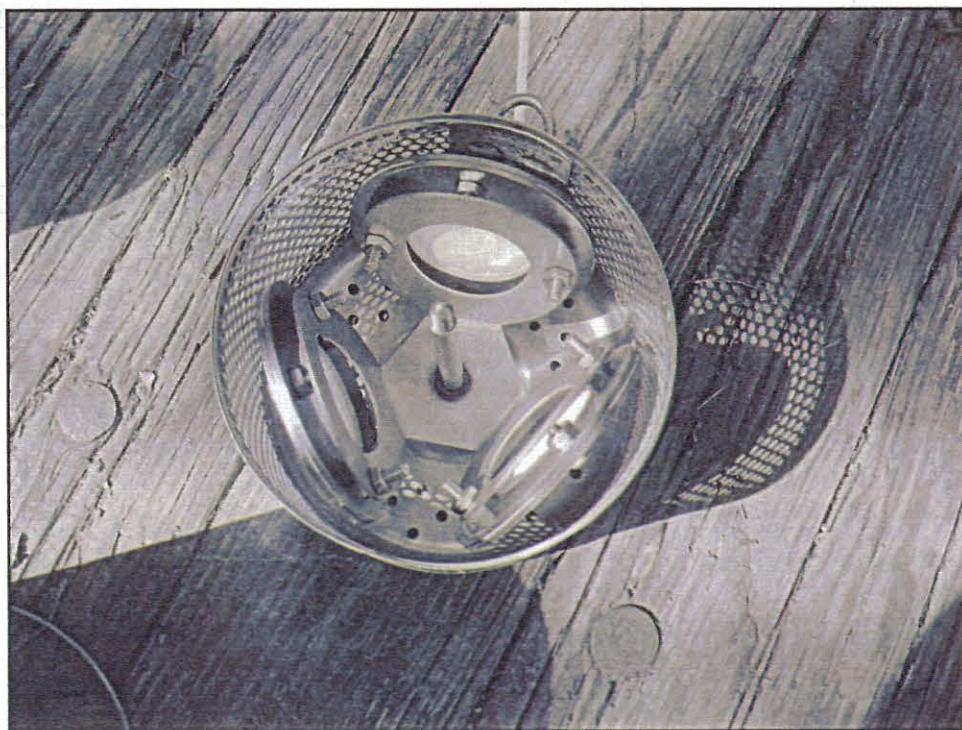
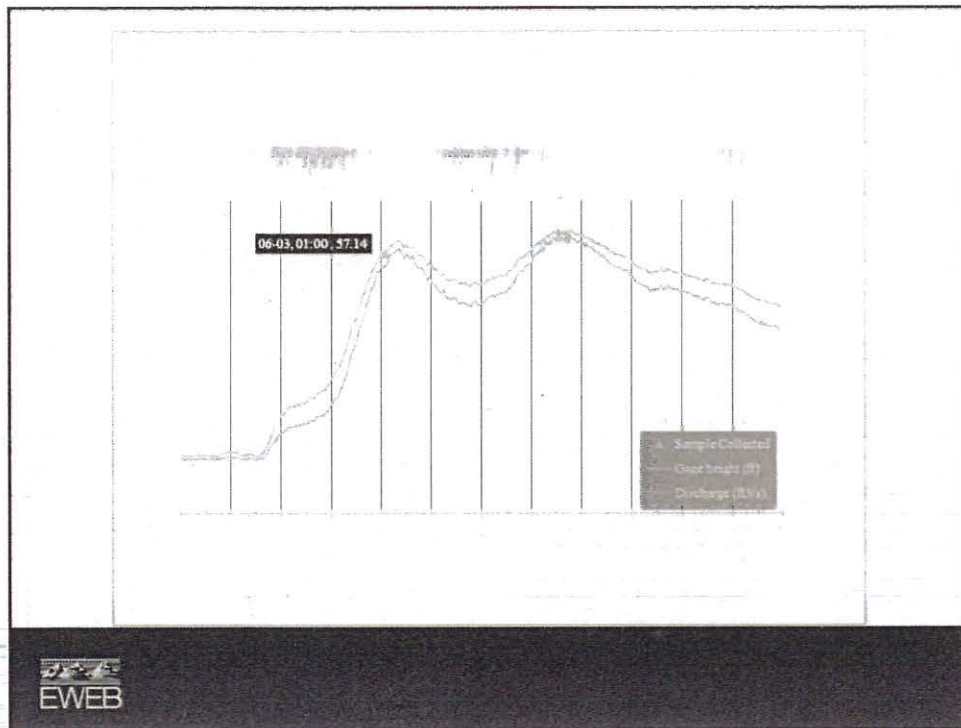


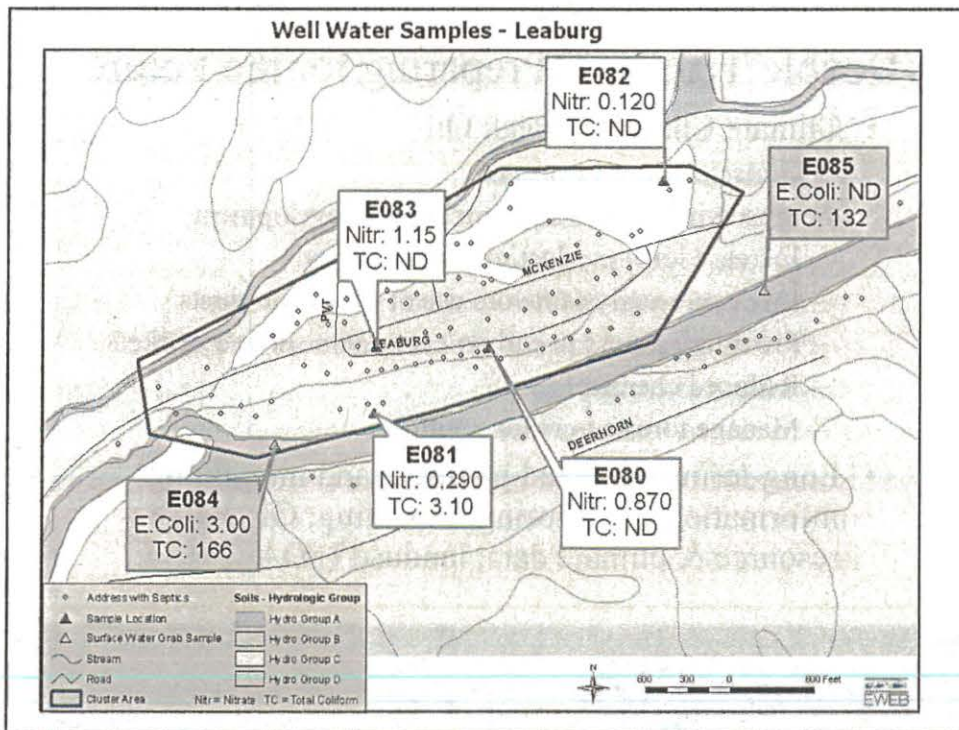
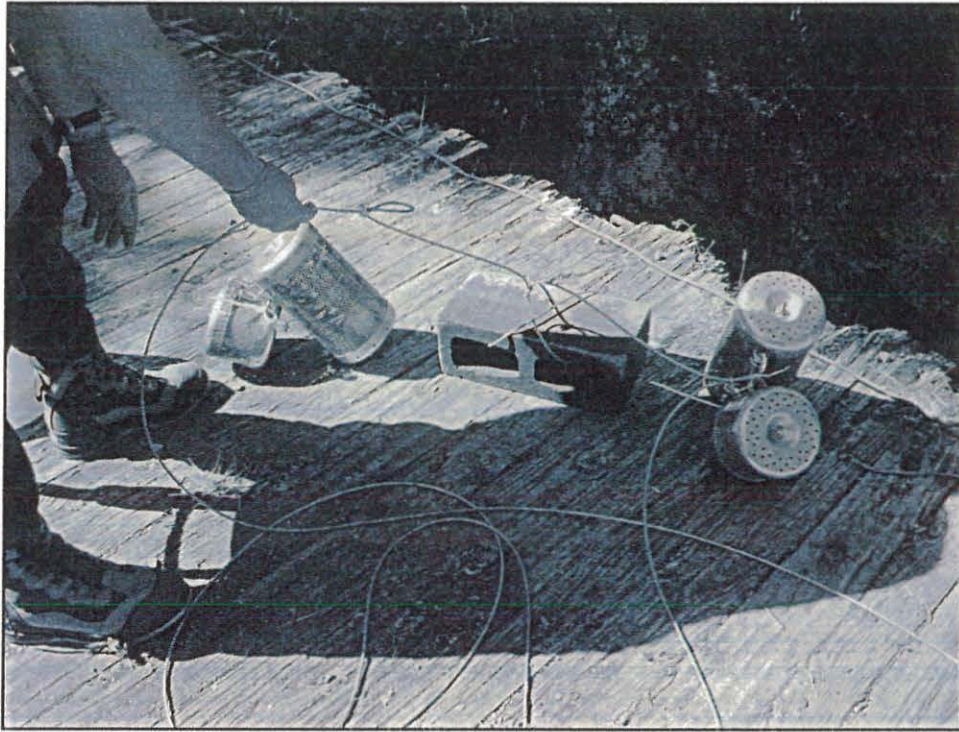
Mohawk River – 2009 Spring Storm Event



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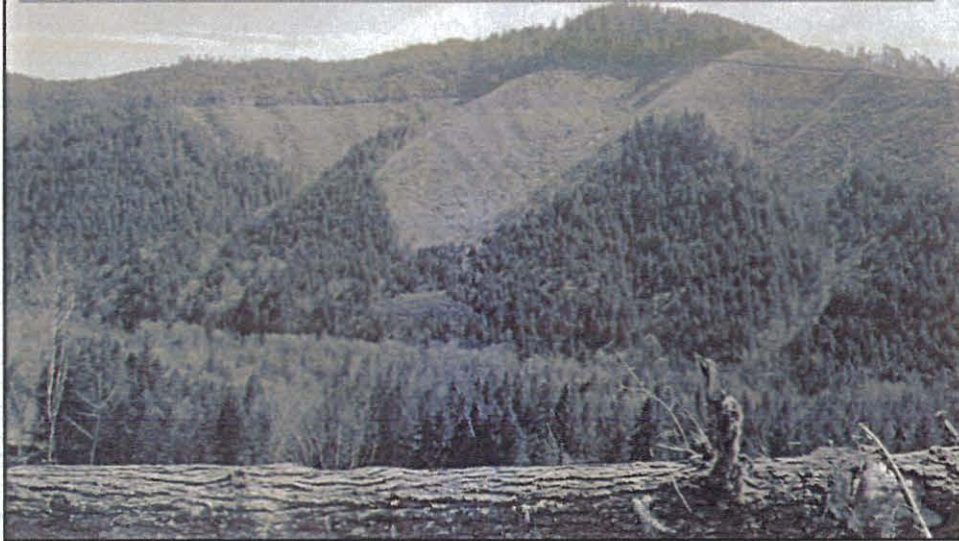






THE LONG-TERM SOLUTION:

Watershed Protection Through Community Support of Forestry
– preserve healthy forests and increase economic viability of
forestry while reducing chemical use



Double Trouble – Preparing for the Future

- Climate Change & Peak Oil
 - Understanding its impacts
 - Preserving forests and farms from development
 - Increase local production versus imports
 - Life cycle analysis favors use of timber products
 - Providing access to carbon/ecosystem service markets
 - Reduced chemical use
 - Manage forests to reduce wildfire
- Long-term watershed planning and integrating information (monitoring, modeling, GIS, water resource & climate data, landuse/LiDAR, etc.)

Forest Fires

- Participate in USFS fire simulation exercises
- Coordinate with USFS on use of fire retardants in watershed
- Work with ODF, industrial and private forestland owners around forest fire prevention, response and



preparedness
EWEB



EASTERN LANE FOREST PROTECTIVE ASSOCIATION

3180 Main Street
Springfield, OR, 97478
(Incorporated)

President:
Ted Reiss
General Iron Works Co.

Vice President:
Paul Wagner
Ultimate Acquisition

Director:
Don Anderson
Autumn Holdings

Cary Hart
Gardens Land and Timber Co.

Karl Morgenstern
Foghorn Water and Electric, Inc.

Mike McDowell
Hillman's Company

Larry Peterson
Peterson Family Properties

Gene Stevens
Bakers Lumber Co.

Advisory Director:
Don Reiss, Manager

Dan Shultz
City of Lane County

Lena Tuckee
City of Lane County

Greg Wagenblast
City of Lane County

Nancy Ashlock
City of Lane County

Doug Ledgerwood
City of Lane County

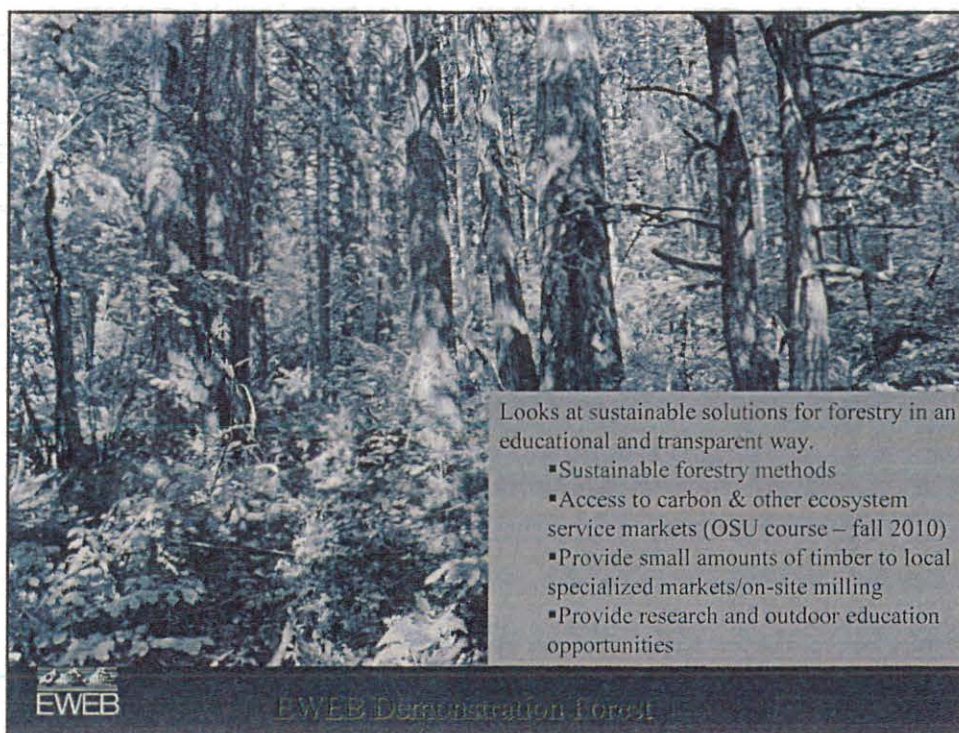
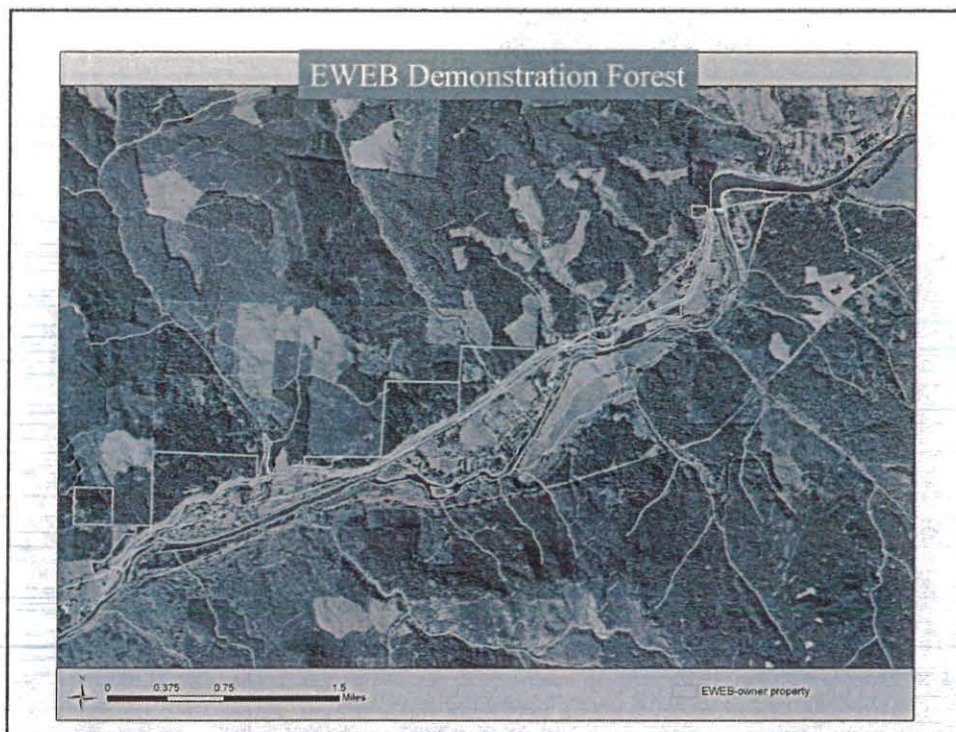
Mike Dykstra
City of Lane County

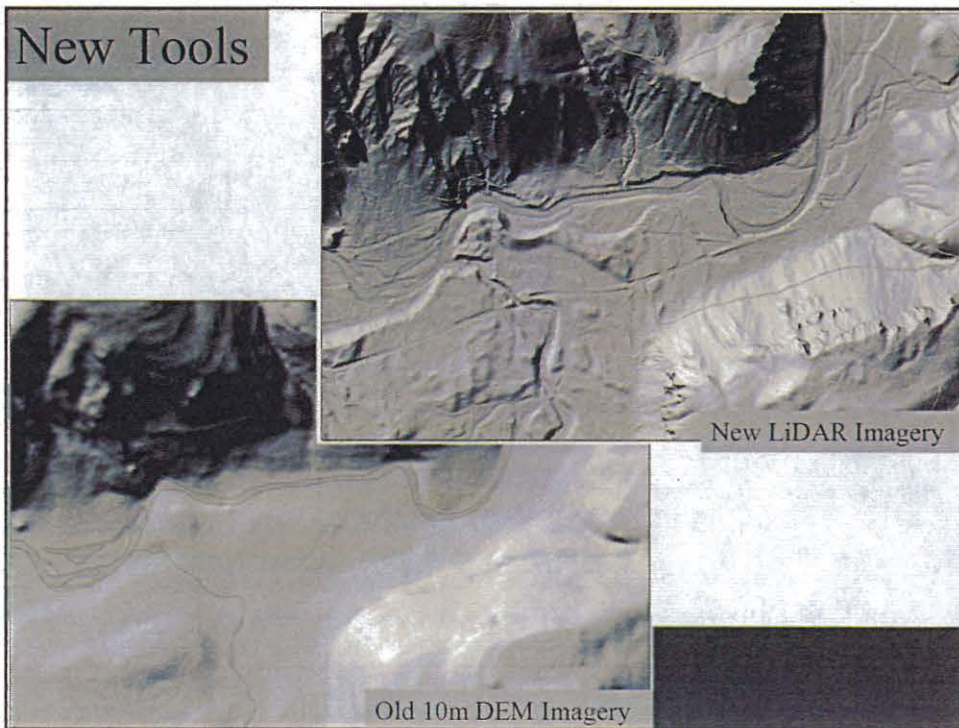
Mary Ellen Holly
City of Lane County

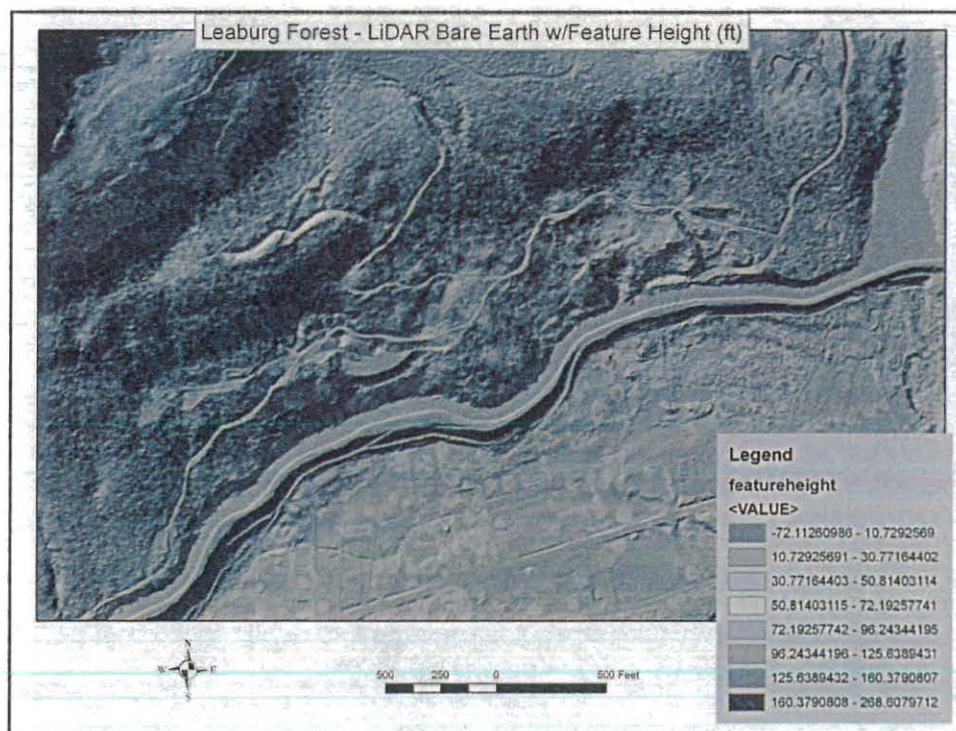
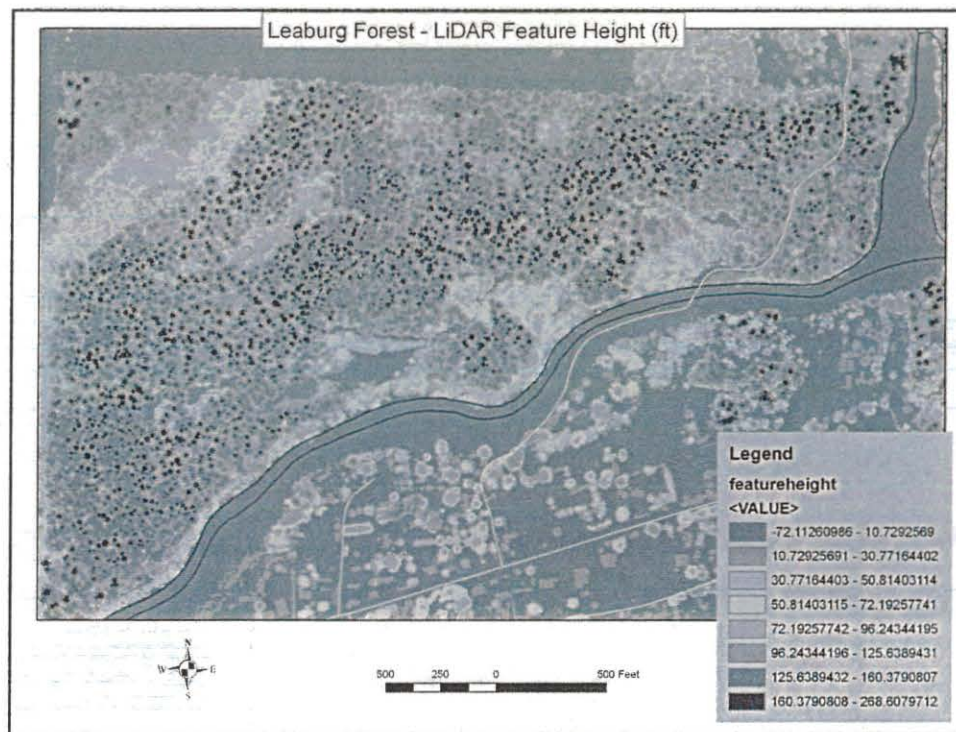
EWEB

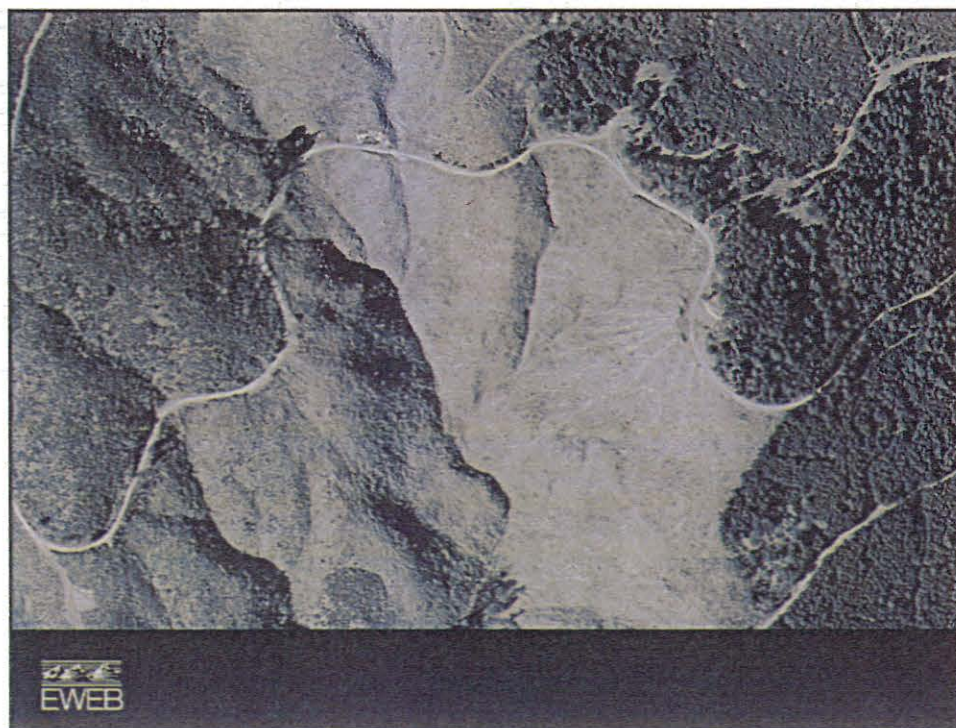
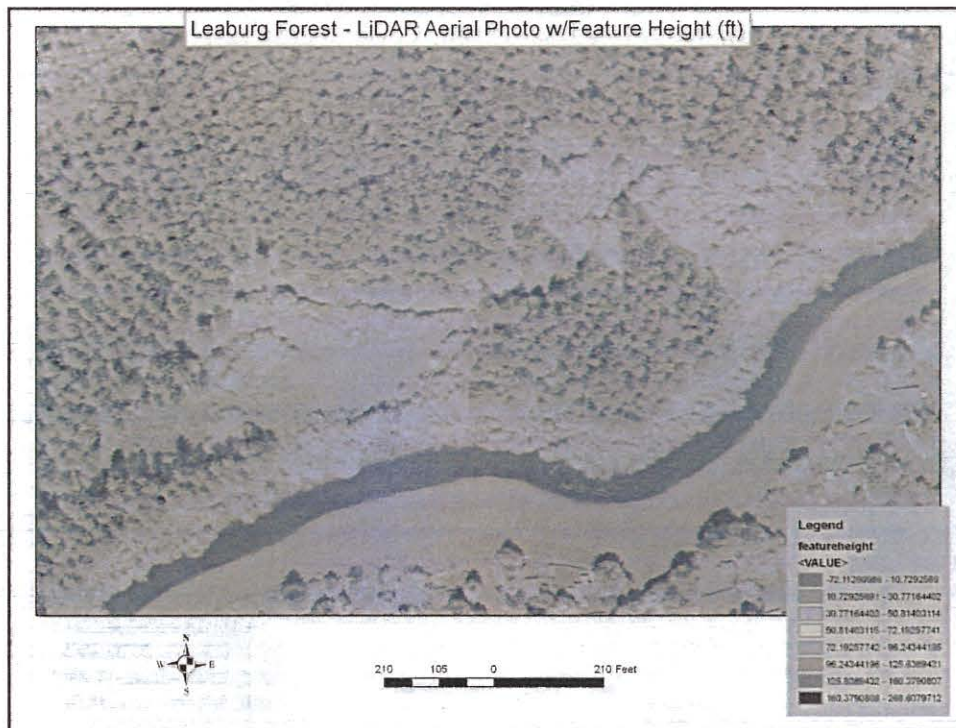
PROVIDING FIRE PROTECTION IN LANE COUNTY FOR OVER 100 YEARS!

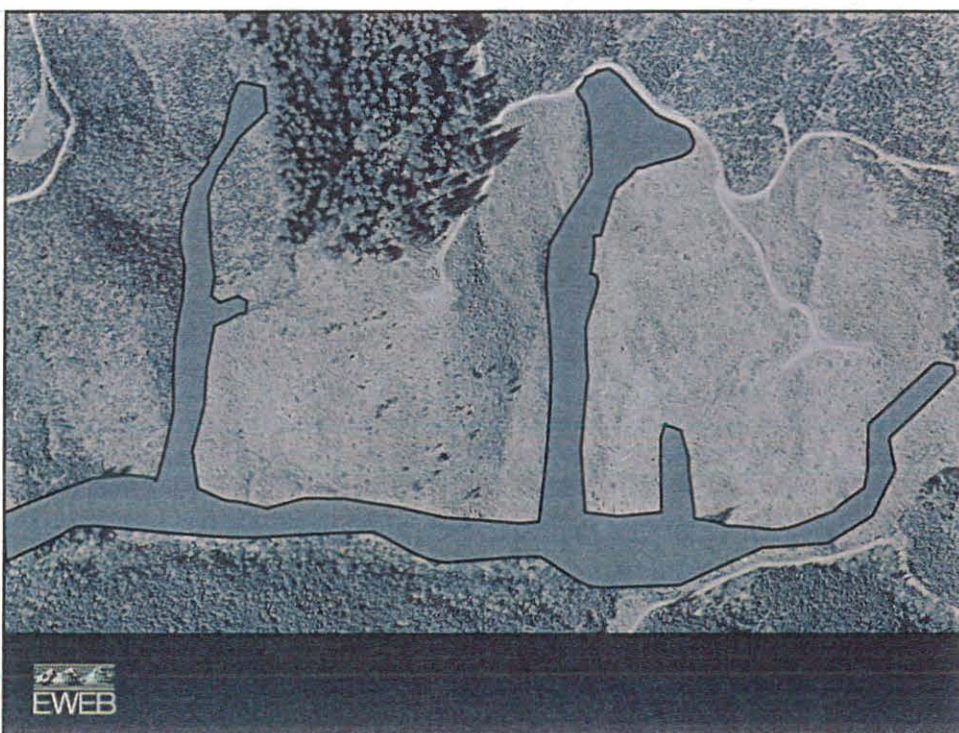
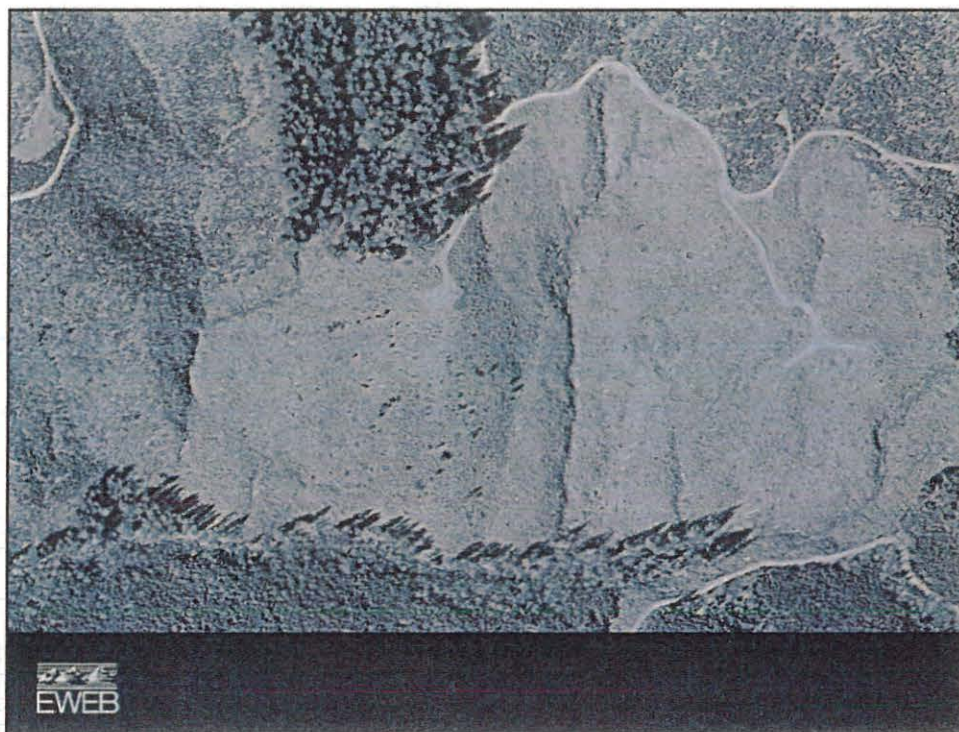


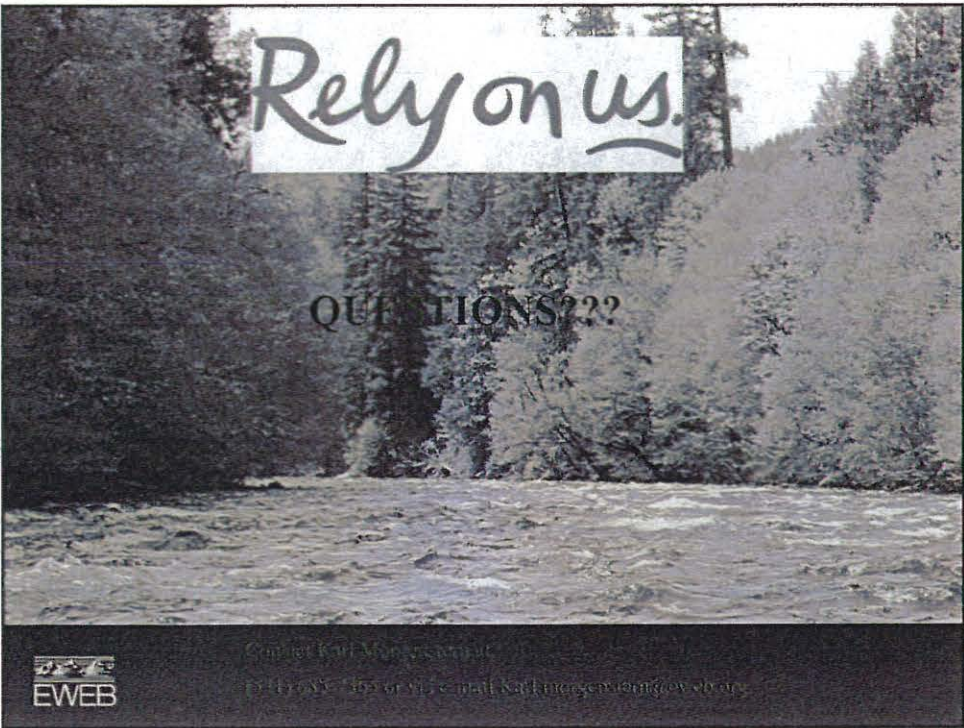












Rely on us.

QUESTIONS???



Contact Karl Mungerson at
847.635.4633 or e-mail karmung@eweb.org



Date: January 12, 2010
To: Karl Morgenstern, Eugene Water and Electric Board
CC: Bob DenOuden, LCOG
From: David Richey, LCOG
Subject: Forest Spray Notice Data Preliminary Summary 2009

2009 Forest Spray Data Summary

This document is to provide you with preliminary summary data for forest spray operations notices encoded for 2009 to date. Please check on your forest activity notification subscription to ensure we continue to receive this data. If more notices for the 2009 calendar year are received, this report will be updated.

Operation Notices Summary

Number of Notices, Acres

The number of notices for this year is smaller than in the previous several years, as is the average acres per notice:

Year	Number of Notices	GIS Acres	Average Acres per Notice
2002	85	10,880	128
2003	74	12,272	166
2004	37	5,802	157
2005	51	10,160	199
2006	50	36,956	739
2007	82	23,185	283
2008	65	15,811	243
2009	34	5,780	170
Total	478	120,846	253

Rate of Application Rate Reporting

The proportion of chemical rate reported on notices continues to be low:

Application Rate Quantity Source	2001	2002	2003	2004	2005	2006	2007	2008	2009	Total
Actual	2	85	57	38	58	18	20	3	4	285
Estimated			7	10	31	31	57	64	30	230

While some 55% of notices report a rate over the course of tracking since 2001, only 12% reported rates for the past year. Notable in these reported rates are three notices with likely incorrectly high rates of 20 gallons and 10 gallons per acre applied of a suite of compounds. Data was entered as shown on the notices, but the results in terms of estimated gallons per acre are likely to be skewed because of this. This has a slight ripple effect in terms of raising estimated rates for all years.

Another confounding factor in attempting to estimate gallons of chemical applied arises from the reporting of planned activities as opposed to actual. Many notices contain numerous chemical compounds, but not all are necessarily used. In the estimation process all chemicals listed are assigned an actual or estimated chemical application rate, and these are summed to give a total rate of chemicals per acre. Notices with the highest rates of application across all years have either suspiciously high rates of application, or numerous chemicals listed per application.

Spray Operations by Catchment

One of the primary purposes of collecting forest chemical application data is to observe and rank the most treated catchments for further monitoring. Because of the difficulty in accurately estimating the rate of applications for which no rate is reported, the following steps are taken:

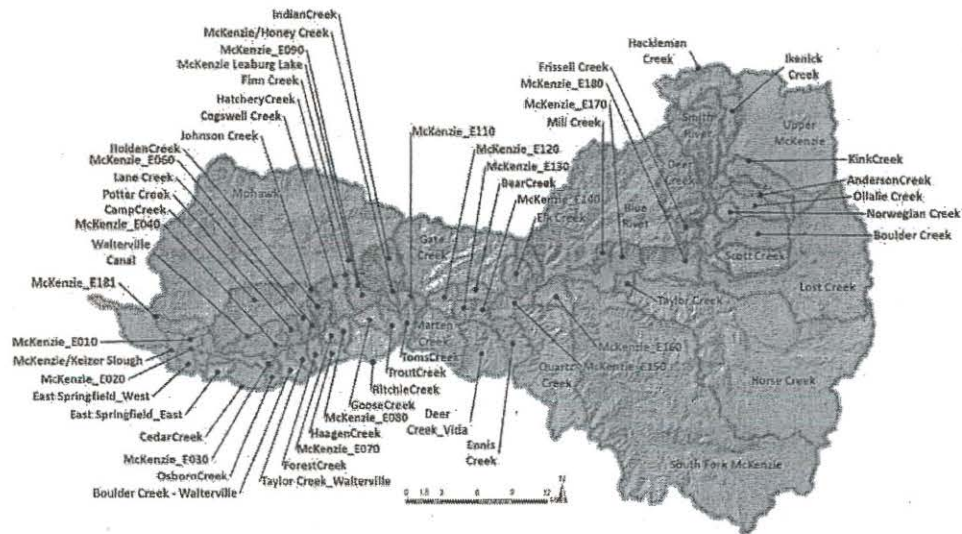
1. Rates for application with no rates are estimated from applications with reported rates.
2. Application rates are pro-rated by type of spray activity.

Estimated rates can be seen in Supplement Two, Estimated Spray Rates. Proration of spray amounts by activity is given as follows:

Method	Proration
Backpack	0.3
Hack/Spray	0.3
Ground	0.3
Roadside	1.0
Aerial	1.0

Even with these measures, estimated gallons of chemical applied are not considered a comprehensive estimate for focusing monitoring efforts. Therefore, the following table summarizing 2009 spray activity presents total acres reported (GIS tabulation), prorated (by method) estimated gallons, and acres prorated by the same method as gallons. The attached map, "Forest Spray Applications 2009", shows this data geographically; the figure below shows catchment names. The table is sorted on prorated acres. Note that very small estimated application rates can result in no value for the estimated gallons.

Further tabulations of analytes by catchment, acres by catchment and method, and estimated application rates by compound are given in supplemental tables.



Basin Name	GIS Acres	Estimated Gallons	Prorated Acres	Average Estimated Gallons per GIS Acre
Mohawk	2274.4	35,163.2	2,134.3	15.5
Quartz Creek	787.2	2,766.7	787.2	3.5
Gate Creek	610.6	1,854.2	572.1	3.0
Camp Creek	500.7	3,334.7	461.7	6.7
Ennis Creek	225.2	4,184.1	225.2	18.6
Holden Creek	182.4	2,516.7	179.6	13.8
Johnson Creek	161.7	1,116.6	160.0	6.9
Goose Creek	109.9	116.3	105.4	1.1
Deer Creek_Vida	103.8	1,883.5	103.8	18.1
McKenzie_E070	115.8	513.7	102.3	4.4
McKenzie_E150	81.6	290.6	81.6	3.6
Cogswell Creek	83	268.8	73.8	3.2
McKenzie_E160	71.4	254.0	71.4	3.6
Marten Creek	60.6		60.6	0.0
Haagen Creek	60	0.1	60.0	0.0
Lane Creek	52.5	163.8	52.5	3.1
Boulder Creek - Waltherville	50.5		50.5	0.0
McKenzie_E180	40	98.7	40.0	2.5
McKenzie_E080	34.8		34.8	0.0
McKenzie_E170	31.8	78.6	31.8	2.5
McKenzie_E181	18.3	680.0	18.3	37.2
McKenzie_E020	12.6	9.2	12.4	0.7
Horse Creek	7.9	19.5	7.9	2.5
South Fork McKenzie	7.2	17.8	7.2	2.5
Taylor Creek_Waltherville	15.6	1.5	4.7	0.1
Hatchery Creek	3.1	7.8	3.1	2.5
Waltherville Canal	5.5	2.5	2.0	0.4
McKenzie_E040	5.2	0.5	1.6	0.1
McKenzie Leaburg Lake	0.7	1.7	0.7	2.4
Totals	5714.0	819.0	5,446.5	

Other Updates

In ongoing efforts to improve data encoding and analysis, the forest spray data base was revised over the past year. The primary key was changed from an auto-incrementing id to the spray notification id, and the geometry associated with each spray notice merged into a multi-part feature. The effect of this is to have one record and one spatial feature associated with each notice. This reduces the effort in tabulating and calculating the data. Additionally, steps for encoding the data in tabular and spatial form has been updated, and attendant spatial data models and queries updated and internally documented to ensure data quality and consistency over time.

Supplemental Table One: Analytes by Catchment

The following table tabulates the analytes reported for use by catchment for 2009 spray data.

Chemical Name	Camp Creek	Cogswell Creek	Deer Creek_Vida	Ennis Creek	Gate Creek	Goose Creek	Haagen Creek	Hatchery Creek	Holden Creek	Horse Creek	Johnson Creek	Lane Creek	McKenzie Leaburg Lake	McKenzie_E020	McKenzie_E040	McKenzie_E070	McKenzie_E150	McKenzie_E160	McKenzie_E170	McKenzie_E180	McKenzie_E181	Mohawk	Quartz Creek	South Fork McKenzie	Taylor Creek_Waterville	Waterville Canal
2, 4D Amine 4	X	X			X	X			X		X					X						X				
2,4-D (LV6)																						X				
Accord Concentrate						X			X		X										X	X				
Arsenal																						X				
Atrazine	X	X			X				X		X					X						X				
Atrazine 4L	X		X	X																	X	X				
Atrazine WSP																						X				
Chopper																						X				
Clopyralid	X	X			X				X		X					X						X				
Crop Oil	X												X									X				
Crossbow														X											X	
Dynemic Surfactant			X	X													X	X					X			
Element 4	X													X												
Foam buster																						X				
Forester			X	X													X	X					X			
Garlon															X										X	
Garlon 4						X			X		X															
Garlon XRT																						X				
Garlon3A (Triclipyr Amine)		X			X			X		X			X						X	X				X		
Glyphosate	X	X		X	X				X		X	X				X	X	X				X	X			X
Hasten Oil		X			X	X		X	X	X	X		X						X	X				X		

Chemical Name	Camp Creek	Cogswell Creek	Deer Creek_Vida	Ennis Creek	Gate Creek	Goose Creek	Haagen Creek	Hatchery Creek	Holden Creek	Horse Creek	Johnson Creek	Lane Creek	McKenzie Leaburg Lake	McKenzie_E020	McKenzie_E040	McKenzie_E070	McKenzie_E150	McKenzie_E160	McKenzie_E170	McKenzie_E180	McKenzie_E181	Mohawk	Quartz Creek	South Fork McKenzie	Taylor Creek_Walterville	Walterville Canal
Hexaxinone	X	X			X				X		X					X						X				
Imazapyr 4	X	X	X	X	X						X	X					X	X				X	X			X
Lv6	X		X	X																	X	X				
Metsulfuron Methyl				X																			X			
Milestopne VM+		X			X			X		X			X						X	X		X		X		
No Foam																						X				
Oust					X																					X
Oust XP	X		X	X																	X	X				
Razor Pro																						X				
Roundup															X										X	
SFM																					X	X				
Spyder																						X				
Sulfmeturon Methyl	X	X	X	X	X				X		X	X				X	X	X				X	X			X
Sylguard 309																	X	X								
Syl-Tac Surficant			X	X													X						X			
Transline	X		X	X		X	X		X		X			X		X					X	X				
Triclopyr	X	X			X						X	X										X				X
Velpar					X		X									X										X
Velpar DF	X		X	X		X			X		X										X	X				
Westar (Hexazinone + Sulfometuron methyl)							X									X										

Supplemental Table Two: Average Gallons Per Acre for Estimation

The following table is derived from all year's data and is built to from actual reported rates to estimate rates for reports where this information is missing.

Chemical Name	Observations	Average Gallons per Acre	Average Gallons Standard Deviation
2, 4D Amine 4	1	10.00	
2,4-D (LV6)	3	6.92	11.33
2,4-D Savage	1	0.24	
Accord Concentrate	110	0.55	2.10
Accord SP	6	0.37	0.21
Accord XRT	14	0.56	0.14
Activator 90	35	0.11	0.17
AM-40	1	0.04	
Amine 4	26	0.38	0.07
Arsenal	102	1.05	1.53
Asanxl	3	0.22	0.06
Atrazine	11	0.58	0.11
Atrazine 4L	3	10.00	10.00
Buckmaster	1	2.40	
Chopper	54	0.10	0.09
Clean Crop LV6	1	0.13	
Conifer-90	27	0.53	0.01
Continuem	1	2.40	
Crop Oil	5	3.17	2.53
Diesel Fuel	2	3.30	0.00
Dynemic Surfactant	1	0.25	
Epolean	1	0.05	
Escort	21	0.01	0.00
Escort XP	11	0.02	0.02
FighterF	72	0.01	0.04
Forester	6	0.19	0.18
Garlon 4	118	0.48	1.57
Garlon3A (Triclipyr Amine)	3	0.58	0.14
Glyphosate	8	3.12	6.83
Hardball	1	0.50	
Hasten Oil	23	1.61	2.60
Herbimax	59	0.45	2.60
Induce	21	1.00	4.35
Kinetic	9	0.03	0.00
LI-700	24	0.04	0.07
Liberate Surfactant	4	0.13	0.10
Lv6	1	10.00	
Methylated Seed Oil	2	0.50	0.00
Milestopne VM+	2	0.28	0.39
Mirage	4	0.50	0.00
Moract	2	0.55	0.07
Moract	10	0.08	0.11
Mso/Method Surfact	6	0.79	0.53
Non-Ionic Surfactant	1	0.00	

Chemical Name	Observations	Average Gallons per Acre	Average Gallons Standard Deviation
Oust	81	0.07	0.34
Oust Extra	23	0.04	0.03
Oust XP	2	15.00	7.07
Phase Surfactant	4	0.02	0.00
Plantskydd	1	0.02	
R-11	2	0.01	0.00
Razor Pro	4	5.46	9.70
Roundup	3	0.33	0.29
Rozol	1	0.00	
Serine	2	0.05	0.04
Slygard	11	0.05	0.10
Support	71	0.01	0.02
Sureguard	1	0.09	
TME	2	0.06	0.00
Transline	77	0.72	2.95
Urea	11	40.47	18.94
Velpar	3	0.39	0.20
Velpar DF	73	0.83	2.79
Velpar L	11	0.61	0.22
Warrior-T	2	0.12	0.00
Weedone LV-6	1	0.19	
Westar (Hexazinone + Sulfometuron methyl)	4	2.68	4.88

Supplemental Table Three: Acres by Method and Catchment

The following table shows the acres treated by method and basin for 2009 data.

Basin_Name	Aerial	Backpack	Ground	Roadside
Boulder Creek - Walterville	50.54			
Camp Creek	444.91		55.8	
Cogswell Creek	41.27		13.07	28.64
Deer Creek_Vida	103.81			
Ennis Creek	225.15			
Gate Creek	410.58		55	145.03
Goose Creek	103.42		6.46	
Haagen Creek	59.96		0.05	
Hatchery Creek				3.14
Holden Creek	178.41		4.02	
Horse Creek				7.88
Johnson Creek	159.22		2.48	
Lane Creek	52.5			
Marten Creek	60.64			
McKenzie Leaburg Lake				0.69
McKenzie_E020	12.32		0.31	
McKenzie_E040			5.22	
McKenzie_E070	96.45		19.31	
McKenzie_E080	34.84			

EWEB 2009 Forest Spray Data Summary

Basin_Name	Aerial	Backpack	Ground	Roadside
McKenzie_E150	81.62			
McKenzie_E160	71.35			
McKenzie_E170				31.8
McKenzie_E180				39.96
McKenzie_E181	18.32			
Mohawk	2074.28	191.56	8.62	
Quartz Creek	787.21			
South Fork McKenzie				7.2
Taylor Creek_Waltonville			15.6	
Waltonville Canal	0.54		4.91	

**WEYERHAEUSER HERBICIDE SPRAYING AT CEDAR FLAT UNIT,
In the Lower McKenzie Watershed / Cedar Creek Watershed**

April 18, 2010

We the rural residents, of Cedar flat which represent a broad demographic group of retired seniors to families with young school age children and grandchildren, are requesting that Weyerhaeuser Company not use any synthetic chemical herbicides or pesticides poisons on the 34 acres on Cedar Flat Road, at Section 6, Township 18S, Range 1W, unit 2400.

The use of highly toxic and potent synthetic herbicide chemicals on this 34 acre site does not adequately account for the potential harm to existing residents and their historic use of adjacent and nearby properties. Some of these Cedar Flat Road family and business activities are here briefly described and related to the local geographic, topographic and ecological environs of its ground atmosphere:

First, this north facing 34 acres of the Weyerhaeuser property is at the top of the Cedar Flat ridge and at the head waters of the Cedar Creek watershed drainage. The elevations on the property vary from approximately 1400 feet at its' low point at the north property line to approximately 1650 feet in elevation at its' ridgeline property boundary. The Weyerhaeuser property is naturally contoured to drain into the existing historic fish pond on the adjacent neighbor's property. The present flow into that pond of the Everett and Fayette Dormer property is 30-40 gallons of run off water originating on the Weyerhaeuser property. The run off into the ravine fed pond and stream provides potable water and irrigation for two families on the Dormer property while providing irrigation for various other nearby families as the water continues down Cedar Creek as it follows Cedar Flat Road to the base of the hill. These waters are used for irrigation systems for animals and family vegetable gardens for the Cedar Flat Road families living in permanent houses on the 2 mile journey to residents in the lower area of Cedar Flat just below the road fork. Potable and irrigation water is extracted by the residents of Cedar Flat for existing farming activities throughout the length of Cedar Flat Road.

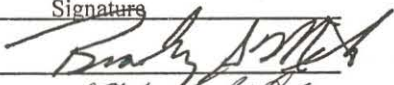

Second, the Paz Blueberry Hill Farm, which is a 20 year old farm with a Certified Organic Certificate through Oregon Tilth. Is adjacent to the proposed spray area of the Weyerhaeuser Company property. Any application drift or after application drift onto the organic farm will violate the organic farm certification and totally compromise the historic business and commerce from the farm. In addition, the Paz family has resided on the adjacent site for 41 years and for the last 15 years, Artemio Paz has conducted a state licensed architectural business under the name of APAZ Architect, AIA from a home office. Also, there are six other property owners with permanent family homes within 250 meters of the Weyerhaeuser property. Three of these properties are directly effected by water quality related to herbicide use on the recently clear cut harvested Weyerhaeuser property.

Third, the headwaters of Cedar Creek flow into the Cedar Creek Partnership of the STEP Program. The Partnership is a collaborative effort by local jurisdictions and Cedar Creek property owners and volunteers working to create a Monitoring and Enhancement Work plan for the Cedar Creek Salmon Trout Enhancement Program (STEP) Project. Amongst other stream use activities and features, the STEP Project will perform fish monitoring, flow management and assessment, Macro water quality assessment, and habitat assessment. Any synthetic chemical herbicide use on the Weyerhaeuser property will certainly compromise the overall enhancement goals of the STEP Program.

Fourth, seven school age children within one quarter of a mile of the Weyerhaeuser property wait on a regular basis at th school bus pick up sites in open air locations down wind of the Weyerhaeuser site. The natural microclimate of these bus waiting sites that the school children use is within the natural movement of ground fog and air currents that are directly connected to the adjacent ground atmosphere activities of the Weyerhaeuser site. Any herbicide materials volatilizing or moved through evaporation of ground moisture at the Weyerhaeuser site will be transported through the ground atmosphere's natural site convection and drift up and down the hill and into adjacent nearby properties.

This description is not intended to account for all of the activities and the persons directly or indirectly affected by harmful synthetic chemical herbicides that are proposed for the Weyerhaeuser Cedar Flat land, but it does entail a brief overview of the huge impact and the extent of the potential disruption to Cedar Flat families and their historic and current activities. This broad collection of both human and natural ecological conditions that exist on Cedar Flat can not be externalized when making decisions to use synthetic chemical herbicides or pesticides into an existing rural residential landscape.

For these and many more reasons that enhance the well being of the Cedar Flat residents, that of fishery habitat, the quality of resident potable water, food and agricultural irrigation, and the maintenance of an uncontaminated ground air shed environment, the undersigned residents of Cedar Flat request that Weyerhaeuser not use any synthetic chemical herbicide and / or pesticides on the Unit 2400 on Cedar Flat Road, Section 6, Township 18S, Range 1W.

Date	Name	Address	Signature
4-18-10	BREDD MILLER	87760 CEDAR FLAT RD	
4-24-10	SARA KRUSOE	87515 CEDAR FLAT RD	



PO Box 275 • Springfield, OR 97477

ATT: ERIN HABERT
OR CHAD SCHOLZE
6/18/01

June 16, 2010

Everett & Fayette Dormer
87065 Cedar Flat Rd.
Springfield, OR 97478

**Subject: Invitation to an Open House at 6:00 to 8:00 p.m. on
June 30, 2010 at the Walterville Community Center.**

Dear Cedar Flats Neighbor,

Weyerhaeuser's Springfield Timberlands Team would like to invite you to attend an open house to meet our operations team and discuss the Cedar Flats unit. We have received your petition, and we would like to address your concerns.

We have a short presentation that will provide an overview of Weyerhaeuser's timberlands, and specific harvesting and forestry background as it pertains to the Cedar Flats unit. It is our hope that we can identify some opportunities that the neighborhood and Weyerhaeuser can participate in together to meet the Forest Practices Act, our land stewardship and fiduciary responsibilities, and neighborhood concerns regarding the tending of our plantation.

If you know of a neighbor who did not sign the petition and would be interested in attending, please feel free to extend this invitation to them. We appreciate an RSVP if you plan to attend – contact Denise Lindly at 541/988-7502.

If you have any questions, please contact Tally Patton at (541) 988-7503.

Regards,

Mike McDowell

Mike McDowell
Springfield Area Team Leader

To: Chad Schultze, EPA Region 10, Pesticide Division
From: Lisa Arkin, Executive Director, Oregon Toxics Alliance
Date: 6/18/2010
Subject: Pesticide Spray in Forestry Practices



On behalf of the members of Oregon Toxics Alliance, I want to thank you and your colleagues for visiting and taking testimony from the residents of Lane County, Oregon on the matter of pesticide use in forestry practices. I trust that we will have continuing meetings and testimony on this subject.

As the EPA moves to rectifying the poisoning of Oregon's natural resources land, wildlife and people from forestry pesticide applications OTA offers these initial recommendations:

1. The EPA must establish a Science Advisory Panel on the matter of aerial pesticide spray and pesticide drift in forestry practices, taking into account these specific issues:
 - a. Slopes – forestry companies must be required to provide geographical surveys of slopes to demonstrate actual slope percentage;
 - b. Prevent drift from reaching rural residential areas;
 - c. Prevent drift from reaching rural-urban interface areas;
 - d. No pesticide must reach domestic wells, reservoirs and other drinking water sources;
 - e. Protection of Type F and Type N tributaries from drift and run-off;
 - f. Prevent drift from reaching schools and school bus routes;
 - g. Prevent drift from reaching organic farming operations;
 - h. Determine accumulation in soil and health of soils.
2. No restricted pesticides in forestry use;
3. No pesticide known to harm aquatic life;
4. No multi-year applications.

Regulations pertaining to pesticides in forestry operations must be overhauled to prioritize environmental and human health. All forestry operations must be conducted in a manner that is sustainable and environmentally beneficial.

Oregon Coastal Range Forestry Tour

June 16-18, 2010

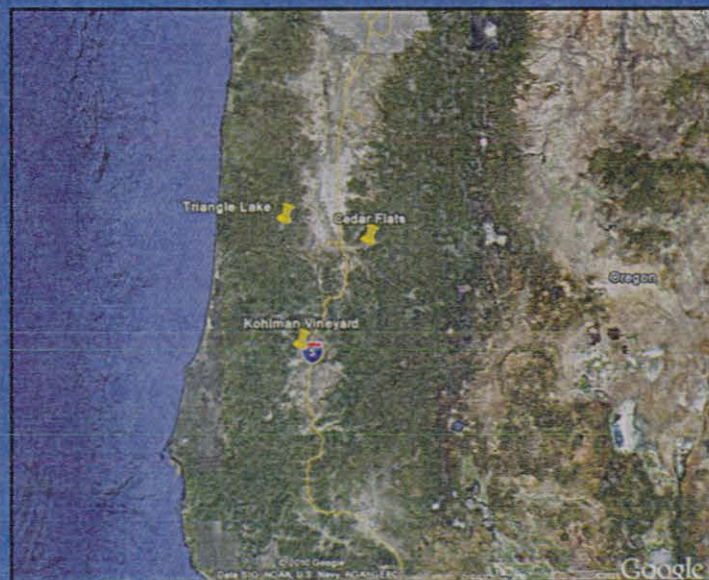
Introduction

- History of the Issue
 - Petition to EPA by Pesticide Poisoning Victims United (PPVU)
- Purpose and Goal of the tour
 - Fulfill Commitment Community
 - Listen and Observe
 - Collect Information (be the Eyes and ears of EPA Headquarters)

Tour Development

- Day Owens and PPVU
- Kevin Kohlman's Vineyard
- OTA and Art Paz's Organic Blueberry Farm
- ODA, ODF, and Timber Companies

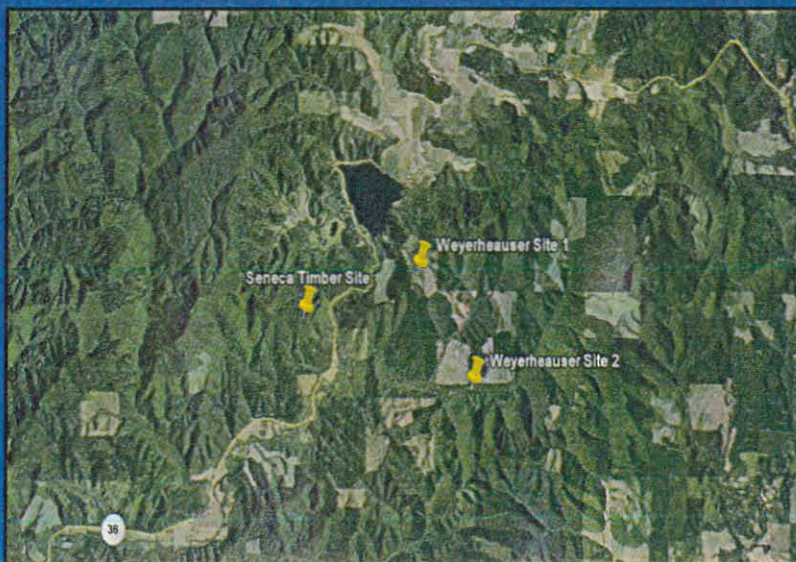
Oregon Coastal Range

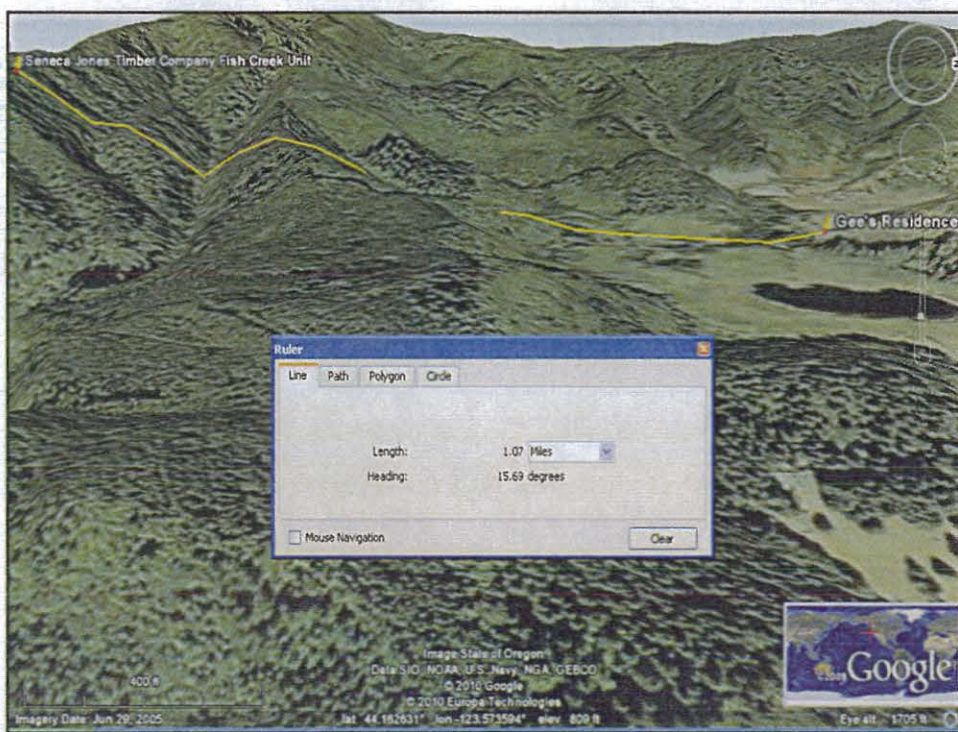


Wednesday, June 16

- Tour along Hwy 36 Triangle Lake Area
- ODA, ODF and Timber Company Representatives
 - Oregon Department of Agriculture
 - Oregon Department of Forestry
 - Weyerhaeuser
 - Seneca Jones Timber Company

ODA, ODF and Timber Company Representatives





ODA, ODF and Timber Company Representatives



ODA, ODF and Timber Company Representatives



ODA, ODF and Timber Company Representatives



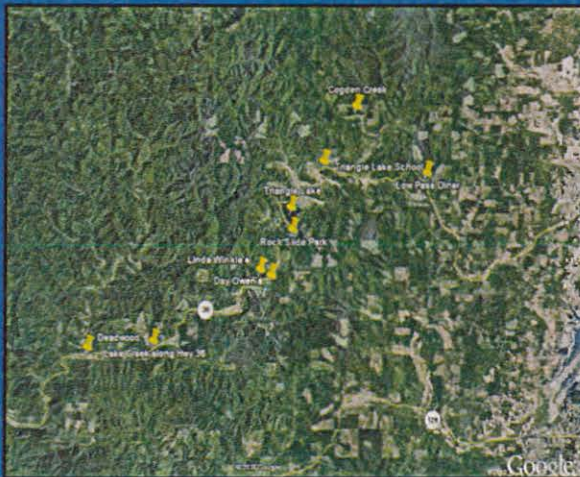
ODA, ODF and Timber Company Representatives

- Summary of Major Concerns
and Issues

Thursday, June 17

- Tour along Hwy 36 Triangle Lake Area & presentation at Deadwood Community Center
 - Day Owens/ PPVU
 - Stuart Turner
- Kohlman Vineyard
 - Kevin Kohlman

Day Owens and PPVU



- Condon Creek
- Triangle Lake School
- Triangle Lake
- Rock Slide Park
- Day Owens
- Linda Winkle



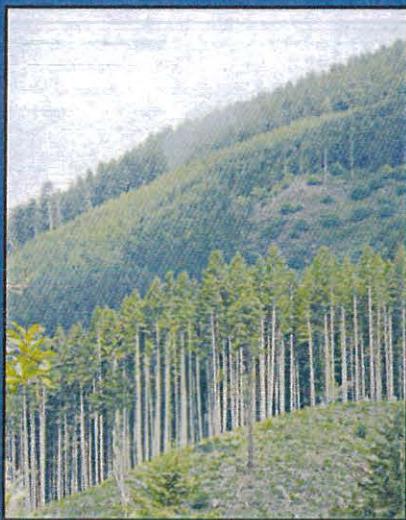
Day Owens and PPVU



Day Owens and PPVU



Day Owens and PPVU



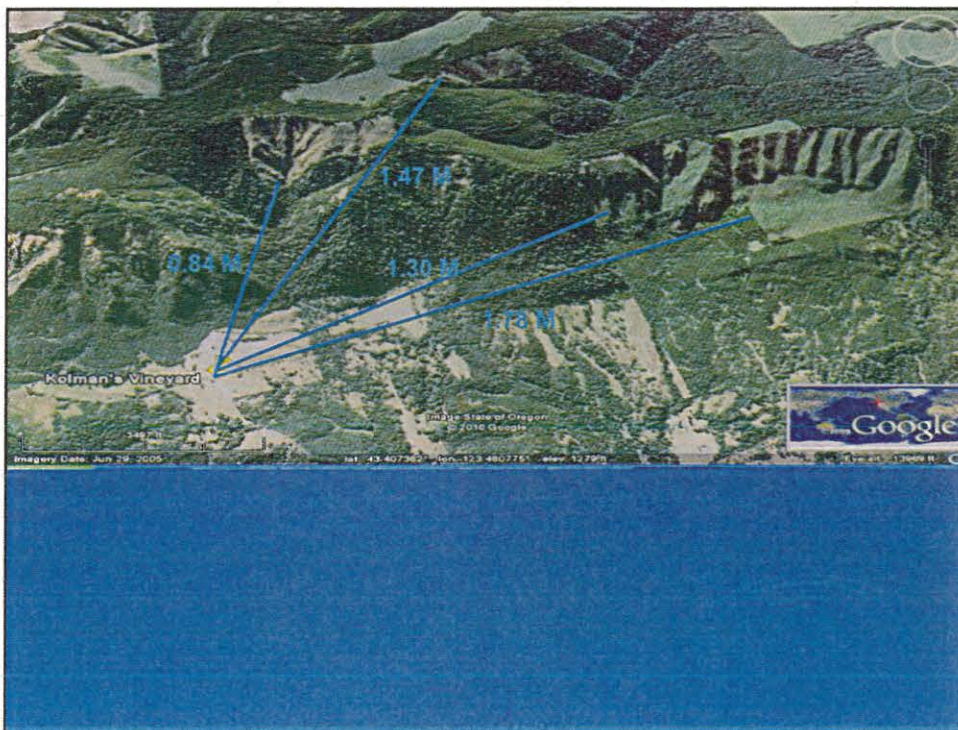
Day Owens and PPVU

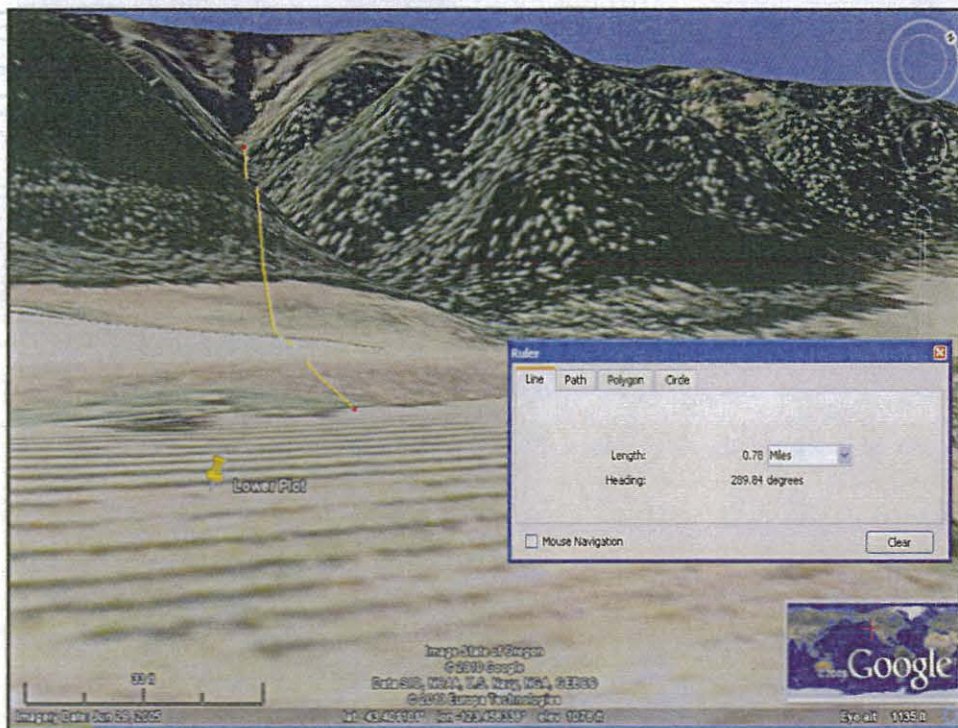


Day Owens and PPVU

- Summary of Major Concerns and Issues

Kevin Kohlman's Vineyard





Kevin Kohlman's Vineyard



Kevin Kohlman's Vineyard



Kevin Kohlman's Vineyard



Kevin Kohlman's Vineyard

- Summary of Major Concerns and Issues

Friday, June 18

➤ Cedar Flats

- OTA
- EWEB
- Art Paz
- Everett Dormer

OTA and Art Paz's Organic
Blueberry Farm





OTA and Art Paz's Organic Blueberry Farm



OTA and Art Paz's Organic Blueberry Farm



OTA and Art Paz's Organic Blueberry Farm

- Summary of Major Concerns
and Issues

Questions?

➤ Next Steps

Chad Schulze's Field Notes
Tour of Oregon Forestry and
Pesticide Use Issues

(June 16-18, 2010)

JUNE 15, 2010

ODA - STAFF MEETING

Chris DOWNLOND AND AGENDA

- SEND ONE APPENDIX A AND
RID CHECKLISTS

• WATER OVERTHROW - PREP DOWNLOND

MAY 2010,

- CURVEWAY
- MAINTENANCE
- METHODS OF OF PESTICIDES
- FUNGICIDES

BAND KNITS ODE -

- DES 526.425 - 526.515
- OPS 526.630G) Forest HERETICS

Act

- ELQWAL
- GROWTH HERETICS
- PROTECT SOIL, INDO, HER, WATER

• ↓ 50% FIRE FOR FOREST

FOREST ASSISTANCE

PRESENT

- MAY INVOLVE HERB RECOMMENDATIONS

FOREST PRACTICES ACT - 5276(2007)

DISSEMINATION

- ON "FOREST"
- WINDMILL TREES ARE GROWN
- HARVESTING
- W/O RELATED TO DOMESTIC TAX

STATUS

• ON "OPERATIONS" 629-600-0102(47)

- ANYTHING ABOUT GROWING/HARVESTING
- HAVE STRONG "LONG CONSTITUTION"

SIX TREES

- ~~THE~~ TREES: (HARVESTING TREES)

HYPER POPULAR < 12 YRS

ADMINISTRATION:

- 1ST EDUCATION + TECH ASST/DESIGN
- 2ND FOREWOMAN (WL, PERMANENT)

NOTIFICATION: 1971/

- REQUESTED FOR CATERING
- 15 DAY WAITING PERIOD

• PESTICIDES

- BRAND OR COMM NAME
- APP. TYPE ADDED
- 2,4-D / ARSLOPPE - SPECIFIC
- ANIMAL OR FISH
- ODF TO MENTION PESTICIDES
- ACCESS APPLICATION PAGES (VIA LMS PAGE)
- FERTILIZERS: APP RATE
- CHAIR/ENTER = WRITTEN

NOTIFICATION

NOTIFICATIONS:

HARD WORK TIME

- CBI on RECORDS INCLUDING APPLICATION RECORDS - MAY BE DECLARED BY AN ITU ~~FOR~~ THEREFORE RESTRICTED PUBLIC ACCESS

Cultural Roles

- NO DIRECT APP. 60' OF FISH STREAMS DOMESTIC USE, LARGE WETLANDS OPEN WATERS 7 1/4 ACRES

- JURISTDICTION → CANNOT INTRODUCE BUFFERS FOR PRIVATE LANDS!

COORDINATION w/ OTHER OR AGENCIES

- SHARED REGS
- 1995 MOA
- ODA = LABEL, LICENS, OFF-TARGET, MOVEMENT
- ODF = NATURAL RESOURCES
- LANDER HOLDINGS COMPANY MORE CONCERN



WESTERN STATES MEETING

- SOIL FERTILIZATION 1ST July
- OR, ID, WA ~~SEA~~ SIGNIFICANT IMPACT.
- OR, ID, WA, COMBINED FORCES TO ADDRESS FERTILIZATION ISSUES (FERTILIZATION) w/ EPA money
- ESA - NO MAPS YET BLT (BUTTERFLEYS LIE IN TWO)

- NPDES ALL STATES HAS DEFERRED PHASE
- ODA = PERMITTING / CM.
- DEQE Follow up.

ODF/ODA - JUNE 16, 2010

- ODF ← BUT FEELS FOR HUNTERS PROMOTED IN EARLY 90'S
- ~~CANT~~ BECAUSE OF INTEREST FOR
- LAND USE PLANNING GROUP HOME ~~SALES~~ ^{FOR} SIGHTING
- WAY HERE - COUNTRY FARM
- IDENTIFIED CONCERNS FOR PESTICIDES
- V - COUNTRY
- ITEMBER PRODUCING COUNTRY

LEAK SMITH -

DAVE LOEBS - DIRECTOR

FOREST MANAGER

MO

PINK CUMPS - STANDARD SHEP
FOREST

REED FORESTER
• AWARD WANNING
STWARD

EA

DM

DEAD KNOTS - PRIVATE FOREST
DIED

MARGHAN HILL - SUPERVISOR

CS -

—

CAN W/ EPA / DAY / SW

PINK - INTERVIEW

DAVID - ODF

CONCRETE

1 - FIRE PROTECT

→ 16mm

2 - 76K ACRES STATE FOREST

3 - PROVIDED LAND OWN AGREEMENT

1900 - 1910

- LAND OWNER COOPS TO
PREVENT FIRES

- 10 FIRE 1910 3 MILE ACRES

- OR FIRES AS WELL

1914 BOARD OF FOREST

→ FIRE PREVENTION / FIRE
MANY GORE

1930 - MANY LAND GIVEN IN

TRUST TO ODF TO MANAGE
BECAUSE OF FIRE

- 90,000 ACRES FOR SCHOOLS

FROM ACQUISITION ACT

1960s - ECOLOGY MOVEMENT

1971 - FOREST PRACTICES ACT
1st IN NATION

- FPA - ~~paying~~
- LATES - Δ 2008) Country Δ through history)

- NOTIFICATION PROCESS

- NOTIFICATION PROCESS MAY BE REQUIRED.
- OPERATIONS RESP.

0 COUNTRY FIRE POND - 1960 SEVERELY

0 LAND USE ZONING MAY ADD TO ISSUES.

SINTERFLEX TO B61

~~BRITNEY~~ BUTCHLEY, OR
PROD/CNA

→ TRIANGLE LAKE AREA

LSR - BLM LAND

LOWL HABITAT

PATCHWORK OF STATE

FEDERAL, PRIVATE OWNER

SHAD

- SUGGESTION INFORMING FOREST

AT RESIDENCES

- WILLIAM

- GREG

- WILLY

- WARE HOUSE -

- DEER MANAGEMENT WAS

IMPROVED OVER 30 YRS

MADRID STREAM

- SITE SPECIFIC / LONG TERM

OF CHEMICALS

- ADDRESS ALL THE TIME

ARE VERIFIED BY THEM

PARITY ENVIRONMENT

IS ADDED

- 50,000 ACRES AND UP

- 5,000 AND 8000 TREES PER ACRE

TREE F S - SFE -

AMERICAN FARM SYS NONPARENT -

- CENTS ARE EXPORT - HOW MUCH

DO THEY COVER

- LOWEST CEREAL PRODUCTION

% OF APPARENT TREES

OWN THE COUNTRY / COMMERCIAL OPS

- COUNTRY PLANT

0 FREE TO GROW

ZINC JUST PLANT

WYE MUST "FREE TO GROW"

PHOTOS 1-3 LOOKS SOUTH

0 MUST LEAVE 2 LEAVE OVER

CEASE CUT (C) ON 25% CREEP

55 ACRES FOR GROWTH

BROAD COUNTRY BURN 10m

root

Grey - area planted / spec

SPRAY CUTE PEEP)

CUT IN FALL MAYBE LEFT

BOUND "HACK AN SOUTHERN"

- HERE IN FALL

- PLANT IN FALL (11)

THE GREEN -

- NO GREENY TREE

HARVEST LAST YEAR

0 NO MORE WEEPS - MUST WATCH

SPRAY

EVER

0 FEELER 20 / THEN BYE

0 2 x FEELER 20 THAN PESTICIDE

0 ECONOMY NEED TO KNOW DOWN!

* LINGER / SAME TREES = CHIPS

PHOTOS 4-7 LOOKING NORTH

COUNTRY 25612 "BURN" KENT

0 • NOTIFICATIONS -

LET ALL POSSIBLE CUEM
MAY NOT APPLY ALL
USED

• ROAD MANAGEMENT AGENCY

PHOTOS 9-10

FRESH CREEK

LAST SEPT SPENT

SPUR BOOM USED

FORMAL INVESTIGATION ODF/COA

- COA WILL SEND INTO D

EPA

0 ODF REASONABLES TO RESPOND

TECHNICALITY ISSUE - HREASONS
EFFECTS ARE VISABLE

PHOTO 11 - MAP OF REASONABLE REACTORS

TO CUBS / APPS

0 ODF - FORKS SAY THEY DON'T RESPOND

BUT NEED TO LOOK AT VULNERABILITY

0 JPA - RESPONSIBLY

ODF - ANNOTATE CONCERN -

PUT BACK JRG ↑ REASON
↑ PESTICIDE RISK

0 ODF - ODF NOW WATCHES

AND SEVERAL APP.
IN PROBLEM AREAS

— PAST ERAN HENNS
HOUSE

2:12 PM
SANGA JONES FOREST
MERE EVANS

3 GROWING STOCK
MANAGED
DAN CLUMP

SPRING AND FALL APPS

↳ BUDS ↳ GIVE PRAP.

0 COMMUNICATIONS INFO IS
FOLKS - OCEAN FOREST EDU. INSTITUTE

0 NEED TRUST REINFORCEMENT

SIC - MAKE OPERATIONAL
MANAGE

+ FISK CREEK PACE

- HAVE THREE PRIORITY APPS

- REVIEW AN ISSUES

- ONE OF THE MOST

GENETIC ISSUE OF

FOREST

- THEY MAKE PRODUCE

DELEGATIONS

0 WITH RESPOND TO NEEDS

FOR APP RECORDS

- BEFORE AND AFTER LINES

AT PEOPLE'S REQUEST

0 TENTATIVELY - LICENSED

BUT NOT APPLY PEOPLE

READ LABELS ADD.

3/4 OF A SECTION

400 PAGES - 166,000 PAGES

- HARD REPROD SITE OCT 2007

NO 2008 (PLANTED)

1 SPENT APPRECIATION

MAPLES BY HAND

0 WINDOW OF OPPORTUNITY

MUCH MAY HAVE SEVERAL

DAYS OF RECAPTURES

0 CURRENT ISSUE ARE

Above

- TOWN CAME AND OBSERVED

THIS APPRECIATION

2 PHOTOS ON GROUND

11-14 DAN GEE MEN GEE COMPANY

LOOKING WEST

0 SYN - DO NOT WANT TO RECORDS

NEEDS FOR DATA / RECORDS

UNDER WE WOULD THROUGH

WAS HAND SPAYED

PHOTOS IS -

LAKERS SCHOOL

O OPPONENTS DECISION

~~then~~ FOLLOWING THROUGH

O WIT - NO - ARREST APP.

BACK PACK SPRAY

SCHOOL EVACUATED - ?

LOOK INTO INFORMATION

TREN DAVIS

POPPLE CREEK RD FROM

126 HWY

40 MINS FERGUSON - LOW PRESS

WPA - LABELTHRU TO PHOTOS ABOUT
APP IN CONTACT PAGEODE - STUDY VERY BARREER
APAM FR

ODE - STUDY

ALST STUDY - FALL 2010
S. YAM HILL MONITOR - ~ FALL 2010
PSP

O 9% FUND REDUCED IN STATE

BUDGET CONCERNING FV / FIZ

- SAMPLED ONE TIME BUT
HAVE NOT ANALYZED...NO VISIBLE SPATTERS SO? ON
ANALYSIS.

6/17/08 - 8:35 AM -

0 1-LABEL OKAY

0 2-CHANGES IN DATA

0 3-CONDON CREEK CLEARCUT

✓ LAMON BEARING STREET

0 * EXPOSURE ROUTE

1-SPRINGS ON CREEK

2-ROAD SIDE APPS

JAN/GARY RUNNER PROVIDED
PACKAGING ON GDOT SPAY
ISSUE

✓ VSW - SPAY SEASON FEB-JUNE
ACT.

✓ SITES GET SPENT 2-3 TIMES
PREP - THEN NO YOL

ON PGES

0 ✓ PURPLES

== TERRANCE LAKE SECTION

0 ✓ ONLY - FORCED TO CUT DOWN
TREES

✓ MANUA RELEASE

✓ CUT BACK MAPLES

✓ PREVENTED

0 HIGH CANOE RATE AT SCHOOL

2-RESISTANCE CANOE

0 ✓ CUT 5 BOYS 2 DEER OF ↑

0 ✓ CAN'T KEEP PRODUCE
ON TARGET SITE WITH
CURRENT CONDITIONS

== TERRANCE LAKE PARK 9:35 AM

TL - IS NEAR WATERS OF SILVER BEAR

MAINT CLEAR CUT ACTIVELY

BEARING CUT

HOUSE AT BOTTOM WAS HERE

0 ✓ WOULD LIKE TO SEE FISH
ENCLOSURE HERE

DO THE RESEARCH

DO

LAKE CREEK FALLS

PHOTO OF CLEAR CUTT

NO DOT - SPRAY DIRECTLY TO
WATER DURING AD 2000-2001
APP. (GET PHOTOS)

WAS AERALLY APPLIED

SPRAY SPRAYED 2008 ISN
SLOPE 70% OR MORE

DAY SPRAY DEET VASK FORCE FEEDS
EPAS BUFFER ZONE ENTO.

DAY MOUSE 9:55 AM

MONASTERY ORGANIC FARM

WHIPS OF FOG ON TOP OF HILL
SPRAYED - GOT STICK WENT TO
DOCTORS HAND

RECORDS

FOR CHOKS VALLEY AND MOVES

PESTICIDES OF TARGET

CLEAR CUT WITH EDGE OF THE

TREES - SPRAY WHERE WOULD

GET STICK

STREAM USED FOR WITHERS

FARM AND ~~HERE~~ (USED TO USE

FOR HOME BUT NO LONGER)

STREAM GOES RIGHT TO SALMON

BALANCE

HILLS BEHIND ARE OWNED

BY DAY 100' FIRST CEDAR

THEN OFF THEN BLN

WILL WELL CUT IN 7:50 YES

DAY EPA SHEET RESPONSIBILITY
FROM PARC -

"WHEN TAKEN CHEMICALS"

PERSON PARC WES SITE

IS PARC PART OF OPA?

SO HOW CAN WE TRUST PARC?

IN CONCLUSION

TO WORK OUT FOR OUR INTEREST

- Skip 99 yr stop - 3 yrs ago was ~~not~~ exposed WAS SICK FOR ONE YR JUST PREVENTED HOME

UNDER WINDING

WILL USE TO OWN MIDDLE OF GARDEN NOW LEASE PAST RILBERTY

WILL SPEAR 21ST OF JUNE WILL BE GROUND SPEAR
 ODOT SPRAYED ~~FOR~~ PRAIRIES INTO SON'S WINDOW, ALSO ROSEBUSH FOREST SPRAYED
 → SWITCHED TO GARDEN SPRAY

SP - 1300 EXP. AND IN LAST 5 YRS

STO. TYPES STATIONS you

• IS IT PERMANENT

- OR • WHAT LEVEL OF STATIONS ARE REPORTED OUT TO APPURTENANCES MEASUREMENT PROCEEDS

• GATE HENRY - LIVED HERE SINCE 74
 2 mile up NEWGOWN ME AD

• CLUSTER OF HOUSES 5 YRS AGO SPEAR

• @ MOUNTAIN 5:00 PM

RESEMBLING FOREST
 • HENRY HANDED HERE STEP SLOPE - ~~BEFORE~~

PRESENTLY BLUE BERRIES FOR PINKIES WERE 1 FOOT BUT FEET AWAY

• APP WOULD STOP AT EDGE OF PROPERTY BUT WIND BROUGHT IT ONTO HOME GARDEN.

* PLANTS WERE HOT LEAVES

CURLED

* HEARD BEEPS NOW WAS

ASANA

* CALLED ~~BEES~~ EVERY
AGENCY

OF BEHAVENED CAR

~~BEES~~ SAID

HAS FOUR KEYS GO INTO

THE KEYS

// * OPEN MEETING

PHOTOS OF ROSEBERG CASE
B.

* AVERAGE SCORE 65%

o * PHYSICAL GEOMETRY

o * 2 VERTICAL DEPRESSION
ISSUE

o * HISTORY OF HELICOPTERS

o * DECENTRAL AIR MOVEMENT

SPRAYS IN

* FOG / LAYERING

* TUNNELS

* REGAL BONES

* NOSELE ISSUES

* AIR MOVEMENT

* SPEARS

TwinCam 11?

* HEIGHT OF HEAVY

~~IRON~~ -

IRON - GIE

o * HAVE HARD WATER HERE

EFFECTS CURRENT

* 541-520-6205

MAKE WINDOW - WH

called 541-988-7501 - wants

to share about GEORGE KEATS

300m curled (in) TO CALL ME

WHEN HE GETS THE CHANCE

T-I-S

Er 136	Sotterbach
--------	------------

Heavy 138 W.

TACO	BELL
------	------

For McKay

Course 2 Fall

72

TOP OF HILL
PEAK OF HILL
STEP

W. E. VAUGHAN - 360-733-9029 (235)

23

001
Jensen
MAY 17 1968
62-1-78

rod 12/15/20

1957

25/11/20

11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	-----

5

2

100

4/5 KK

Subscribed & sworn to.

A hand-drawn flag with a cross and a cross-like symbol.

99.98 acres

Request

Samperi Thoren Jib-ty 2005

5ppm

$$+ND - 2.62 \text{ ppb}$$

• TYPE RESERVE UNIT

~~Need of A/C~~

Great

Collected moment of spring

Bottom varied its position

✓	SW CORNER
---	-----------

✓ 95,00 per sample

✓ FUND - THE TOP PRIORITY TO PUTTING KOL

Stamp

0 ✓ Ben comparing sprays
 all neighbors property
 so no one can be
 held accountable
 because many people
 used

0 ✓ EPA must test
 drift in local
 conditions

→ 1100' straight up
 top of clear cut

0 1100' ✓
 check formations
 traveled more than
 1 mile?

How does this effect
 definition of "close proximity?"

0 TYEE SANDSTONE

* TYEE RESOURCE CLEAR CUT
~~all~~ ~~climbing~~ FROM LOUSER
 VENTURE

65% SLOPE BOWL FACED
 DUE EAST

* VALLEY SANDWICH

0 ~~EST~~ BOTTLE (3)
 CAPS

0 LOST BOTTLE

0 LOST FORWARD

WIND MODEL \$25,000 GEMD

OSU TEST DR. GREG, E. JONES

PATTY SKYRER PAD

the dog on water vials
happy on snow

2. Apply to groups

07:40

$\Delta S_{\text{total}} = \Delta S_{\text{system}} + \Delta S_{\text{surroundings}}$

2
Lungs

②

Pres fast
DART ~~fast~~ ✓
best ✓

Levert

WIS. ACKED
JOINED LA

JOINED ✓ ATT

Dec 17

42 Acres

AT 2020-11

Mr. Morley - EWE'S PUBLIC OWNED

07-11-14

2000	Party
------	-------

- documents OKF
over/atc with

over/atc what's

\$280 per year for 47
Notiff on 11/25/00

~~Not different~~

KNOWS WHEN (BEAT)

(Time) App were happen
is important

It's the property

— American Society
Auto Sampler

02070 SAMPER

3

503-1541-17

0 2009 FOUND PROPOSALS AT
ANTWERP

0 2010
- INFORMATION TO STRAIGHT
UNIVERSITY
PUNOFF

JANET PUNOFF

0 - CAN'T USE PESTICIDES
IN RURAL INTERPHASE

- yr/yr USES OF PESTICIDES

- DARED BULKY
- NEEDED CLIMATE

0 - COMPLETION NEEDS TO
BE INTEGRATED INTO
REGISTRATION

0 - LAST FALL HARVEST
APPROX SPRAY SURVIVED
90% OLD STAND

* AER/EVENT BLOCKED
ROAD STOPPED SPRAY

0 * BULKY BEHAVES NEXT TO
CUT ~ 50m
HOUSE IS EVEN CLOSER

* 32-40 AGE CUT

* SOIL IS CLAY BASED

EVENET - WHY DO THEY HAVE TO
SPRAY? SPROUT BROWN

PHOTOS

GO UP TOWARD RD TO TOP
THE SHOOT N AND NED DOWN
ONTO BULKY AND AER

* EVENT IS A FORESTER - PMS HOUSE
ALL FORESTRY PRESENT

* MINIMAL CONSIDERATION

WY
B. EWERS NOWS ARE
SIGNIFICANTLY DIVIDED
BY THE RAIL EFFORT
AND DRAINAGE

6" STAN AND WETTER IS
HIPPED BY SEVERAL TRAP
TO SAMPLE FOR CHER'S
NEAR SITES

* ELSEWHERE REPTILES
CITY OF WINDY PORT

PHOTOS IN EVERETS

15' N^W TOWNED M. TC
2ND S^W " " CLEAR CUT
WINDY
3/4 AT POND 6" DEEP 350PM
200' FROM CLEAR CUT

5/6 - S^W UP SLOPE TO TOP

(MR. = MEKONGSE RIVER)

7 - AT BACK AT PER DRAINAGE

8/9 - DOWN IN CREEK LOOKS
BACK UP SLOPE (S^W) CREEK
FLOWS N^W (YEALE FORD)

CREEK CREEK FORD → MR

10/11 - POT WARE WHERE SPENDING
IS FOR CREEK TO POND

DR. - DOUGHERTY COUNTY HAS SEMI-LAR
PULSE OR LARGE SCALE -
TEMPERATURE 130° DIFFERENT

REPORT - SPENDING FOR COMPOSITION
DOES NOT MAKE SENSE
DOUGHERTY FORDS CAN

LA - JEFF JANKESY - LOOK FOR
STO DIES ON DOUGHERTY COMPOSITION

1 - FERRIS NOT THE ONLY TREES
OF VALUE

✓ NO 2210 ~ REQ, ONLY CONTR
IN AWAY WAY THAT
PROTECTS AROUND NEARBY
RECOMMENDS

✓ QTRK + OPK 93 USEING
ORD SPEAKER DATA

EVERETT - PER DOES NOT RESEED
WEN 75 HUMUS SOIL - CEDER
HAYPOCK DO VERY WELL
RE-SEED SPARKS

✓ HAVE SEASONS w/ ~~more~~
WILK THANKS + WEY NEED
TO SPRING

7060E WEEKLY

March 16, 2006
Feb. 28, 2008

Erin Halbert's Field Notes

**Tour of Oregon Forestry and
Pesticide Use Issues**

(June 16-18, 2010)

Tuesday 6/15/10

ODA - All Staff

Brad Knotts, ODF

Forest Pesticide Use

• ODF Overview

- fire protection
 - private forest
 - public / state forest
- 780,000 acres

• Focus Private

- forestry assistance
- OR forest practice act (FPA)

→ Decentralized field organizations / offices

- 20+ offices
- 20-30 field foresters

- Forestry Assistance
 - technical advice
 - cost share / asst programs
 - ~~recommendations~~ many include herbicides

→ Tax Credits, forest resources, trust, federal programs (USDA)

• Forest Practice Act

- ~~jurisdiction~~ jurisdiction: location & activity

• location: where trees are grown & harvested w/out regard to zoning or tax status

- Operations activity:
commercial grazing
& harvesting ~~forest~~
trees
- harvesting
- road construction
- slash treatment
- pest/fert use
etc...

there are a few exceptions-

- Pesticide use

- aerial & hand spraying both subject to F.P.A.
- & roadside spraying

- Notification to ODF
- required for chemical application
- 15 day waiting period
- Pesticides
 - brand, application type, additives
 - for 2,4-D & triclopyr - must specify amine or ester
 - ODF to maintain public access application rates (via label page.)
- Fertilizers
 - application rates
- 15 days can be waived for ground application
- can change chemical w/ written notification to ODF.

- ODF has Subscriber list - annual fee to receive notification of spraying

- must keep daily app. records for 3 years

• ODA can request specific records w/in reason

• Can claim CBI on app records if feel necessary

• Once ODA receives records - become public

• People will ask ODA to get records if turned away from company

ODA will only request w/in reason (for a reason)

- Notification from 1970's
• upto legislature not agency

- Chemical Rules

• Def. of chemical
Pesticide
additives
fertilizers
oils

• Context & purpose - used properly, safely

• Prevent, stop, control, contain, report, cleanup spills

• DEQ - spill cleanup

• protect waters of the State

- NO direct app. buffers

• retain vegetation after logging

• Daily app records (similar to ODA)

→ Early 1990-changed application rates near residential areas / habitual areas

- Deal w/ complaints

- investigate
- Does FPA apply
- refer to others (ODA?)
- joint investigations

- Working w/ ODA

• 1995 MOA b/t ODA & ODF

• shared regulations of forestry use

• work together

- ODF focuses on natural resources on forest operations

- ODA focus on label, licensing, off-site damage

2009 ODF lost pesticide specific position

- Contacts

- Marganne Allen
- Brad Knott's
 - general forest pesticide
 - specific operations
- field office contacts
- PARC - pesticide analytical resource center

Issues more w/ larax
companies & citizens
than other groups

Wednesday 6/16/10

- Meeting @ ODF office
w/ ODA

@ 10:00

West Lane Country Tour

- stream buffers based
off ecological reasons
not pesticide based

- early 1990's - housing
People buffers but
removed b/c didn't
have authority to
set/enforce -
must be legislative
change

ODF

Dave Lorenz
Paul Clements
Link Smith

Brad Knotts
Maragonne-Allen

ODA

Dale Mitchell
Mike Odenthal

EPA

Chad Schulte
Erin Halbert

o Brief History of ODF

- fire protection
16 million acres
- State forest
786,000 acres
- Private forest
12 million acres
- Started 1900-1910
fire protection
- Officially 1911
Board of forestry
created
- 1930 - trust relationship
w/ counties to
manage lands

→ Prior to F.P.A. - 1941
Conservation Act

w/ attempt @
reforestation

- ecology movement
1960's

- F.P.A. 1971
first in nation
w/ lots of support

→ FPFO: forestry program
for Oregon
ODF Philosophy

- Social
- Economical
- Environmental

Balance b/t 3 to find
sustainable forestry
management

- changes to F.P.A. over
years

→ Notification Process

- Not a permit
- Who, what, when where of forestry operation
- ODF processes & informs applicator of any near by protected resources
- written plans may be required
 - another communication tool
- pre-operation & active operation inspection

to West Lane County
w/ ODA & ODF

→ Fish Creek

w/ Weyerhaeuser (w.H.)

3 Weyerhaeuser people

- Hal, Team lead
- Willie, local

- Drift Issues:

- way better control now
- GPS on helicopters
- Extensive mapping
- GIS

very site specific focus

least amount of product used

◦ Sustainable forestry initiative

- all WH. sprayers certified
- outside audits

(most large land owners - forestry co. - have similar audits)

- Other certs through T.F.S. - Tree Farm System

◦ for ops

smaller than 500,000 acres

WH. w/ certs: "above & beyond"

Also have logger certifications

◦ WH uses specialized people to apply pesticides

◦ have own aircraft and contractor

Trees have to be "free to grow" w/ in 6 years

- F.P.A.

replanted trees free to grow above competition

usually replant ~2 years after harvest

have to have average 2 trees/acre on clear cuts over 25 acres

- F.P.A.

@fish creek site

- Ridge: looking S/E

• Where we are just
down slope from
Road

- logged late fall
about 6 years
ago

- broad cast burn
rare case -
so no spray

- able to reforest
1 year earlier

• Grey Slope

- re-plant Feb.

- site prep spray
last Nov.
broadcast spray

• spray planned
before even
logged through
site analysis

- only broadcast
site application
until harvest
~50 years

- hand spray -

"hack & squirt"
on big leaf maples
(very specific)

to reach free to grow

- Brown

- just logged

- to be sprayed in fall

- Next Slope / Green

- ~12 years

- See Scotchbroom but won't respray

trees should be able to just grow over Scotchbroom

- fertilizer

- @ ~20 years first fert. app.

- then ~ every 8 years

- receive some concerns but not nearly as much

Wt uses twice as much fert as pesticide in a year

- trees grow 3-4' / year

- want shorter growth time as possible

- pesticides for economic reason

- growth return -

gonna grow

faster w/out competition

average 40-50
years growth
until ready for
harvest for
lumber
(lumber Primary
harvest)

— Stream @ bottom
of ridge / gully
winter plan to
protect don't
harvest / spray
along

✓ Special unit—
along stream

✓ sprayed last
sept.

✓ spot treated

✓ see buffer vs
spray area

✓ split boom
technique

✓ investigated unit

after complaint
from Erin Cree

Dale will provide
case.

→ Seneca Jones
Timber Company

2 Seneca people
•
•

- two main spray
seasons

• Spring - during
budding

• fall - site prep
before planting

- there are some
outreach means
but there ...

(what are they? :)

- some one on site
for every application

(mostly Mike)

- very aware of
weather conditions

- temp
- rain
- inversions

(• fog?)

- Always do a
recognition flight

- hire 3rd party
professional
applicators for
pest application

but have own specific
standards

- always ear to
ground communication

- Seneca chooses
pesticides used

- fall application
already out to bid

- tentatively decided
to set for October

- respond to requests
when community
wants to know
what pest. Used.

- talk to neighbors
ahead of time

- Training & licenses
& recert. credits

- Are familiar w/
labels

- have a partnership
w/ applicators

but - their responsibility
to know

- end spec
- Streams
- App. rates
- Safety concerns

→ fog issues

• Never fly in fog

• may be in valley but
not where spraying

• This Site

- Spray 2007 fall
site prep

- Spring 2009
spray herbicide
application

- ~~Apply~~ plant 2008
Spring

- hack & squirt
maples by hand

• Multiple companies

• Small window to apply

• So may apply multiple
days in a row

• → but other flights:
reconnaissance, fire

→ Triangle Lake School

- School got \$ for trees
- WH cut for them when logged adjacent site
- community wanted not to use pesticides
- would maintain & get free to grow
- WH planted trees & hand sprayed their site
- since community didn't want aerial spraying

→ Definitely quite the contrast of School & WH property

Thursday 6/17/10

Community
Pitchfork Rebellion

- Day Owens
- Stuart Turner

• others...

Chad, Allen, & I
met @ diner w/
community

-road w/ Day Owens

0 - Pesticide movement
in fog

US Davis Study
James Seibert

? HQ Call 6/23?

✓ Coogon Creek
Salmon bearing
creek right
near spraying

✓ Clear cut on one
side of road -
private property
(house) on other

✓ Hill side & road
side work
roadside follows
creek

• Water quality concerns
dead zones on both sides

- NO visible pesticide damage on Day's property that he has ever been able to specify to pesticides

(250 acres)

- Stuart - Turner

✓ worked w/ spray drift task force

✓ - 42 pest. companies

✓ - spray drift studies

✓ - 10-ft stationary helicopters

✓
EPR 1994
info

→ Triangle Lake School

✓ Clear cut 2 years ago

✓ manual release instead of pest. application

✓ School was "forced" to remove trees

✓ high cancer rate @ school ... been trying to get people out to do study

→ Triangle Lake

✓ - beginning source of lake - creek - parallels Hwy 36

✓ salmon bearing creek

-aerial spray all clear cuts all along

(can rear logging over ridge)

-whole ridge in various states of growth

logging basically right to lake

right to houses along lake

✓ Rock Slide Parking lot @ lake creek

✓ - "clear cut all the way down to creek"

0 - aerial sprayed

0 - 2001/2002 Stu took pics of pesticides in lake creek

(requested pics)

✓ - cut/logged ~2 years ago

✓ - Stu would guess ~70% grade

→ Day's House

✓ 35 acres

✓ ~ 1/4 from clear cuts

✓ - watch fog move from hills to property

- pilots have to fly over snags & trees left behind

- creek starts on weyerhaeuser lands on hill behind property

runs down & through Day's property to lake creek

- lots of creeks all along hills like that

- has legal water rights to drink / use water on garden (organic farm)

- never have had water tested (cost prohibited)

→ Linda Winkler's Place

timber property right
to her's

✓ Property line @
middle of garden

✓ Now lease back
more land

✓ "protective buffer"

✓ Scheduled to ground
spray next week

✓ but now claim to
use nastier products
w/ ground spray
vs. aerial

✓ - right off Hwy 34

✓ road spray &
aerial spray @
same time -
many years ago

✓ switch to ground
spraying 2 years
ago b/c sons
condition

✓ - Not sure if whole
hillside to be
sprayed or
hacked & squirt
(maple focus)

→ Deadwood Community Center

✓ - trying to get EPA portal set up

- pesticides } scott
- OSOS } temp.

✓ from DC online:

- Jill Bloom
- Jeff Dawson
- Ashley Nelsen

✓ from EPA on phone line:

- Scott Downey
- Derrick Teraclan
- Suwanna Barta
- Linda Liu

* Stu Turner
Slides/Picts

• Roseberg Trial 2009

Kohlman Grape
Orchards

- Bell 47 Ship
(helicopter)
snow/frozen ground

- 5-10 gallons/lacres

- helicopter ~90'
elevation

Slides are defense
exhibit (from Wilbur-
Ellis)

Slope average 65°
1100ft elevation Δ

- liability all on Pilot

Concerns

- height of helicopter terrain & trees
- diurnal movement in morning
- depressions
- water (creeks)
- fog
- inversions

→ often multiple layers - moves different ways @ once

- very rarely overspray
- Nozzle problems

★ Erin Gee King
Google Earth

- last year's recent sprays (spring & fall)

- WSDA
Tri-Cities Badger Canyon

Buffer Zones

- water hardness / mineral levels

Kohlman Ranch

Type Resources Clear cut

- far point less than 1 mile from lower vineyard (North)

- 65° - bowl shaped

Row Run N-S

95% of time -
prevailing winds
from cuts to farm

- Valley Sandwich
- lost bottle (3 separate)
over ridge
- Type Sandstorm
- Bottle caps →
- 3 miles - lost ford

• wind model put together
\$25,000
diver nail flow

- Greg Jones Southern OR U.
research

- Oregon wine board

Patty Skinkus

Surveys

Cedar Flats

6/18/10

- Art Paz

42 years

1 acre cert. organic
blueberry farm

21 years always
organic

- Lisa (OTA)

- Karl Nordstrom (EWEB)

• Drinking H₂O Protection
Plan

• Balance human health
water ~~quality~~ health

- Forestry

• Tracking harvest
& pest application

\$28,000 for notifications
for entire watershed

68% national forest
20% private

Ag & Urban

eugene 36"-40" rain
to year

55" + where we are

McKensie majority of
Wallaumet river

Pollutants to surface
water during
storm runoff (70-90%)

use American gamma
water sampler

starting to use passive
samplers -

• Weirhauser > 3 pig
• Rosburg
• ~~Registina~~ owners

- Eastern Lane forest
protection association

- Drift - volatilization (fog)

look @ PR Notice
def. of drift

✓ many people here
bigger than companies
(urban/rural interface)

✓ microclimate issues in
a valley

- swaps / soil issues
- cut 2009 summer fall
- 34-40 acres
- creek @ bottom of slope
to Everett's property
(your round)
- 6 ft deep 32-35 gal/min
Aug 1 Sept
- use during power
outages
- ~200 ft from clear cut
- logged own property
over 5 years
- 12" d breast height
only

- Dr. Jenkins, OSL

